"THE STORY OF OUR LIVES FROM YEAR TO YEAR."—SHAKESPEARE.

ALL THE YEAR ROUND.

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NEVER FORGOTTEN.

PART THE SECOND.

CHAPTER XXXVIII. A WARNING.

THE eve of Major Carter's marriage had now arrived. A few stray questions had come, like "dropping shots," from a few inquisitive persons. That awkward and ugly challenge, "Who is he?" was of course varied; some putting it in this form: "Who the deuce is he?" "Who the d—l is this Carter?" But the replies were satisfactory always; and, better than all, Carter was seen quartered with Sir John Westende, that baronet leaning on his arm. A respectable and even brilliant company had been asked, and really secured by the major's exertions, to do honour to his nuptials.

The universal feeling about Mrs. Wrigley was, that she was making "a wretched old fool of herself;" but that about the major was as though he had performed a clever feat, like one who had made a successful venture in cotton or indigos, or had happily run a blockade. "Of course he'll choke off the poor old soul after a time," said Colonel Foley, in a spirit of rude jest, and leaning both hands on his stick, as if it were a spade. "Carter is a little impatient, deu-*side*-ly impatient, I can tell you, and will not wait long for any man—or woman either."

The major was coming home that afternoon, looking down on the flags with a complacent smile of pleasure—for he had happily made sure of a young lord out of a cavalry regiment, who would be as good as a pine-apple for the feast—when he happened to pass near the top of the street, where the Irrefragable had its office. He thought that as he was now going away on this delightful wedding—beginning a new life, as it were—he might as well give them a last injunction. He walked in and put his usual question, gaily adding, that he supposed he would be paid some day—say about the time of the final redemption of the National Debt—come now? Mr. Speedy had not yet returned, but would most likely be home the day after to-morrow. "And *then*," added Mr. Speedy's locum tenens, "you shall hear from us."

"You must direct, then," said the major, still gaily, "to the Great Hotel in Paris, or to the Isles Britanniques at Rome; and I declare I had rather you would not, for I don't want to be worried with business *now*. You don't know, perhaps, that I am going to be married to-morrow morning? We go across to Calais to-morrow night."

"You *do?*" said the locum tenens, astonished. And there was a general up-turning of faces in the office.

When Major Carter left it, his reflection was the old reflection—how ready the world is to do homage to what is flourishing *in* the world. The manner of these fellows "is quite changed to me," he said, "now that they see I am bettering myself."

In the office, the locum tenens said hastily to *his* deputy, "We must have Speedy back at once!" And in a few seconds the messenger was hurrying to the telegraphic-office with a written scrap of paper.

Still smiling, and still moralising on this "cringing" character of the world, the major walked on towards the fashionable quarter. He was painting in for himself this breakfast on the next morning, with the fashionable faces he had secured to grace it. He was reading, in anticipation, the fashionable journal of the day after—The Morning Plush—with the select list. He grew soft and tender over himself, as he thought of the battle of life he had fought, and fought so successfully. "I had only myself to help me," he said, looking back. "I had to fight my own way, and I think I have done very fairly. Always been with the best, and have done them no discredit. This is not so bad a finish." He was still smiling to the flags as he walked, when a carriage, which had passed him, stopped suddenly, and a lady called to him. The major's fingers went to his hat by a sort of instinct.

Miss Manuel had been driving here and there, in fact she knew not whither, still pursued by the eager wish to do something towards stopping the great evil. She suddenly saw Major Carter smiling to the flags (and sometimes tapping them playfully with his stick), when the thought flashed upon her, "This poor wretch! I have been labouring to do him mischief. At this moment judgment may be gathering over his head. He is unworthy of serious punishment for what he has done to *us*—at least others may hunt

him down if they will—and a word to him will be no harm."

The major's smile passed away as he saw who it was. So, *she* was also of that world who came cringing to him as his prospects brightened! But the game *she* had played with him was too serious.

"Major Carter," she said, "I have just stopped to tell you something. I know all sorts of people, and hear all sorts of things. I am told that you are about being married one of these days. Let me advise you—look carefully to yourself. There are dangers that perhaps you have not thought of. Don't think of marriages, or such things. I confess I am no friend of yours, but still I give you this friendly warning."

For a second a shade of anxiety and alarm came into his face. Then it was all clear, and he laughed.

"I know that you are no friend of mine, Miss Manuel," he said. "But I can't be angry with you. You are very clever. I really admire you. But I am not angry with you. We have had our little game out, and it is not for me to say who has been the winner. But you are welcome to the title, with all my heart. I am in good humour with all the world to-night. So thanks, a thousand thanks, for your very melodramatic warning."

He was indeed in good humour that evening. As he walked away, he was greatly amused. "What a clever creature," he thought, "and how well she did it. For the moment she almost took me in. Another man would have been frightened, and perhaps listened to her. Her last move has failed. I should not be surprised if she went mad one of these days."

CHAPTER XXXIX. MAJOR CARTER'S WEDDING-DAY.

THE following morning—the day of the Carter wedding—was a bright one, with plenty of sun. There was great flash and bustle in the little square where Major Carter lived. Nearly every one round knew of the solemnity. Many were at the windows, and a few on the steps. A series of expresses seemed to be flying backwards and forwards between the major's house and other quarters. He himself, bright and shining as a new suit and the very closest shaving and polishing could make him, was seen in glimpses and flashes, as it were, now flinging himself into a cab and disappearing, now dashing out of a cab on to the steps, into the house, as though he had come with a reprieve for a criminal.

So with Mrs. Wrigley, the widow, on whose figure workwomen and maids had been at work from an early hour. She was in a sort of fat flutter and trepidation. As she said often, "the moment of her destiny was drawing on." They had invested her with the richest, stiffest, white satin, which was as inflexible as milled board, and dressed her in it, as though she were an idol. Her neighbours knew of it, and were out on *their* steps; and a great carriage—*not* the chariot, which was wanted for another purpose—waiting at the door, with a huge display of favours and ribbons, proclaimed through the street the general notion of Marriage

She was presently at the church, where there was a block of carriages already, belonging to the gay company that Major Carter had so carefully recruited. It was a fine fashionable temple, where the thing was done in a highly fashionable way, and by a highly fashionable incumbent. Where the cushions showed the impressions of select elbows and select knees; and where the letters of the Commandments seemed to run indistinctly into the characters of the Court Guide. In such a temple the rite received extra solemnity; and the fashionable incumbent was "assisted" by the Rev. Alfred Hoblush. Thus, standing at the rails, in this atmosphere of Belgravian sanctity, with the crowd of ladies and gentlemen of good degree looking on, Major Carter was united to his bride. The fashionable incumbent almost chanted the words of the rite, bleating them, as it were, plaintively; and to his song the work was accomplished.

It was a happy moment for the major. Bride and bridegroom came out together on the top of the little steps in the sort of little slum at the back of the fashionable temple. But many select rites had glorified the slum. Their carriage was there, and the crowd, who lived in the back lane, and whose life was to see marriages driving away in inexhaustible variety. The major and his bride, enshrined in this carriage as in a casket, drove away in a tumult of happiness.

At Mrs. Wrigley's mansion was the breakfast, and the company. Such a company! It did honour to the major's recruiting powers. It had cost him infinite pains and trouble. To some he had to give "bounties;" others, who might be called "bringers," he had to supply with "head-money;" but still there were the ranks full, and a goodly show. There was a nice leavening of aristocracy—Lord Putnenham, and the Honourable Mr. and Mrs. Brownbill, being present; there were some "nice girls," in that gay and glittering plumage which is only seen at weddings and flower-shows; there were officers for the nice girls, men whom Major Carter took pleasantly by the arm or shoulder; there was "Old Foley," tightened almost to gasping, Young Brett, Lady Laura Fermor and her daughters, who had been persuaded to come, with some pains. Young Spendlesham had agreed to come too, but, at the last moment, had sent a note with an excuse about important business. Many and many times did Lady Laura's eyes wander wistfully to the door.

The feast, sumptuous indeed! The arch-pastrycook had looked to it. Everything rich, or delicate, or costly, was spread out. The bride and bridegroom sat side by side. The fountains of champagne were flowing briskly, and faces framed in white bonnets began to acquire that heated flush which always attends on this morning feasting. It is a proud hour for Major Carter.

He thinks again, as he looks down the table, and reciprocates the fat "ogle" of his bride, how he has fought away, single-handed, through life, without aid from any one, and is now ending so respectably.

Now we must have some speeching. It is rather a nuisance—perhaps a little old fashioned; but where Lord Putnenham has kindly expressed a wish to air his rhetoric, such considerations must be waved. He does it very neatly, and dryly—in chips, as it were. A little attempt at humour, which, we may be sure, is not allowed to miscarry. It was an "auspicious" day, he said. His friend Carter, he was sure, had made a judicious choice. He was sure to make the lady he had selected happy, though his friend Carter, he must say, had one fault—he was one of the most unmusical men he had ever met with. (This allusion produced extraordinary merriment.) Yes, his friend Carter, he would do him that justice, did not know a crotchet from a quaver, though he sincerely hoped that in their married life there would be an absence of crotchets of a particular sort. (Roars and applause.) Perhaps that was the reason that he himself (Lord Putnenham) had never married—he was too musical. (Amusement.) The man who had not music in his soul, or would not appreciate a posthumous quartet of the immortal Beethoven's, he would say was fit for treason and stratagem, and all that sort of thing. Though he was quite sure that his friend Carter would not indulge in any stratagems as regards Mrs. Carter (great amusement), whose health he would now propose, &c.

It was a happy moment, one to look back to, when Major Carter rose, with half a glass of champagne in his hand. His white crisp face was a little flushed with other half glasses. He was inclined to say, "God bless you all," many times over. At least he thought he was affected. The image present to his mind was that of labouring through a hard life, and having now finally come into a port of ease and quiet. This he expressed. Mrs. Carter looking up at him with the soft gelatine eyes. "I have fought my way," said Major Carter, with the half glass of champagne in his hand, "through difficulties. I am not ashamed of it. I have made friends for myself, and I hope and believe they are not ashamed of me. I have had troubles, and I am not sorry to have had them. It has shown me the value of friends—of such friends as I now see sitting round me. We are now going away," continued the major, "I and the lady whom I am proud to call my wife. But we shall return soon, I hope. We shall see—and enjoy, I trust—the pleasant seductions of foreign countries. We may stay a long time or a short time, according as we find it; but believe me," and the major's voice faltered a little, "whether long or short, we shall both look forward to the time when we shall return once more and meet——"

Just at this moment, when Major Carter was raising his champagne-glass again, Major Carter's son, who had not been missed at the feast, entered hastily, and hurried down the room, behind the chairs, to where his father was standing. This was an interruption. Every one looked at him, and saw in the son's face a strange and frightened expression. His father, thus checked rudely, and yet seeing that he was making for him, stopped, and looked angrily at him. Every one felt that this was a most awkward gauche creature, and that the major was to be rather pitied.

In a second he was at his father's ear, and gave him a short whisper. "*What?*" said Major Carter, laying down his glass quickly. People at the end even seemed to be straining their ears to listen. The son repeated his agonised whisper. The major's head shot round suddenly to a door behind him. When it was seen again, the champagne flush was gone, and there was a twitching and spasm in the region about his lips.

A mixed company is quick at reading signs. "What the deuce is it?" said Lord Putnenham, putting up his eye-glass. "The man is ill, or has heard some bad news." Mrs. Wrigley, heaving in a fright, said anxiously, "O, what is it?"

The series of ghastly twitches that shot across the major's face were recollected afterwards. So, too, was the worn agonised face of his son. More terrible, too, was it when the major, steadying his face, as it were, by his hand, forced a smile, and brought out a few words.

"A little matter—am sure you will excuse me a moment—shall not be away long."

Again his head turned round to the door behind him—for there were two to the dining-room—and by this one dinners entered. The white bonnets—and the faces flushed with heat inside—began to turn to other white bonnets. Such do not like any "unpleasantness." "Is it an illness?" it was asked; "or what is it?"

Major Carter had gone to that door behind him, opened it, but had shut it hastily, and seemed to put his foot against it. He hurried down the room to the other, that twitch in his face working all the time, and strange falterings coming from him which seemed to say, "Back in a moment—so sorry—a little business." In a second he had shot through the folding-door at the end.

"Dammy!" said Colonel Foley, who had followed all his motions critically, addressing his neighbour, "it *must* be bailiffs!" The son with the miserable face followed him out.

Outside, in the street, the accustomed crowd were waiting—the carriages for the flushed faces, and the old-fashioned swinging chariot (the coach-box removed, with postilions and posters) to take away "the happy pair." The curious were expectant. It was known that "she" was an "old woman." Public sympathy was for *him*.

The gentlemen attached to the carriages were

talking together in a group, and such of them as had canes leant on them.

Suddenly—about the time that it was known that the major was addressing the company—a cab drove up, and two plain blunt-looking men jumped out, hurried up the steps, but had rung the bell very quietly. As soon as the door was opened, they had stepped in promptly, without telling their business, and one of them, taking hold of the handle, had shut the door to, himself, very quickly. The gentlemen outside with the canes assumed them to be connected with the feast. They asked for the major. The servants of the house were all about the hall, some at the door listening (with the freedom pardonable on such an occasion) to the major's speech.

The hard-working faithful son, who was upstairs looking to the last preparations for his father's departure, came down to them. One of the hard plain men, with a sort of tap on his arm, took him aside, and gave him a short whisper, finishing off the whisper with a sharp nod. The son gave a gasp and a half cry, and looked at them with a wild stupid stare.

"Better *you* tell him," said the plain man, "than we—more decent of the two. Ah! two doors, I see."

And he walked down the passage to the door by which the dinners made their entrance.

On him had looked out for a second the white twitching face of the major. To the other, who waited in the hall, the white twitching face also presently showed itself.

"Now, now," it said, "what is this? At such a time, too! Really, most inconvenient! Now, take care," said he, dropping his voice; "is there *no mistake?*"

"On my word, Major Carter, no," said the blunt man.

"Most inconvenient," said the other, rubbing his white fingers over and over each other. "At such a time, too. Come up-stairs with me to the drawing-room for a moment, will you?"

The two rough men agreed, and they went up; Major Carter, in his bright wedding finery, a little in front. Menial eyes wondered exceedingly. The hall door was now open, and the gentlemen on the steps (with the canes) looked in eagerly. There was quite a perspective of menial faces and canes. The two men and the major shut themselves in the drawing-room, and locked the doors.

A few minutes later, the son, with a miserable and despairing face, looked into the dining-room, where was the feast in all its magnificence, and the flushed faces, and he whispered to the person nearest, imploringly, "*Do* go away, and get them to go away. O, something terrible has happened!"

This was but a whisper, yet someway every one in the room had an instinct of what was said. There was a sudden rustle of ladies rising, a sound as of chairs pushed back. Even the newly-made Mrs. Carter—in an agitation she had not known for years—hurried to the door. The ladies fell back from her—female public outraged at having been seduced into this unpleasantness.

"But what *is* it?" said the young cavalry lord. "No one seems to know."

"Bailiffs, as I hope to be saved," said Old Foley. "I know the look of the thing. I remember Tommy Jackson, at a dinner he was giving to a few——"

In a few moments, by some mysterious means, the word "Police" had got into the room. No one could tell how, for no one could know. Perhaps they read it in guilty characters on the miserable son's face, perhaps it was in the air, and had forced itself on every one present. Then it was, sauve qui peut.

"Come, Blanche," said Lady Laura, gathering up her skirts as if she were in the ward of a Fever Hospital. "Let us get away from this dreadful place. Good gracious! Never mind calling up the carriage—they will keep us hours—we can walk to it." She was thinking of young Spendlesham

At the door, the old chariot and the posters were waiting in stupid immobility. The news had not reached the crowd outside. But there was a perfect rout. The gentlemen with the canes were busy. The carriages were plunging and converging to the door, while the old chariot stood waiting for its tenants, as if they were really to come out together. The crowd, thinking so too, gathered more and more on the steps, and looked eagerly into the hall.

They were never to come out together. Mrs. Wrigley was in her bedroom in fits, with a charitable lady or two trying to help her. One gentleman or two, whose sister or mother or wife had left a shawl or a parasol in the drawing-room, hurried up, and, trying the doors, found them locked.

Inside, the miserable Carter sat handcuffed between two officers. They were waiting—charitably—for the house to be cleared.

Finally it *was* cleared. There were wild stories among the neighbours, and a small knot kept about the door for the rest of the day. In a short time arrived Mr. Speedy, who went in. Then the drawing-room door was unlocked, and a cab called. Then the hall door was opened quickly, and a short thin figure, with a white face, muffled in a great cloak, ran down the steps with a blunt man on each side, and got into the cab. "There he is!" said the little knot. There was no glowing list of fashionable company in The Morning Plush; but in the evening papers was to be read for a penny an account of the whole. One called it "The Interrupted Wedding," another, the "Esclandre in Fashionable Life." Translating both, Major Carter was formally charged before a magistrate with the murder of his first wife in Wales, and was transmitted, by the night train, to that jurisdiction, to await his trial. It furnished abundant talk

and discussion for a week, and every one who had luckily been at the breakfast was at a premium.

PHOTOLOGICAL FACTS.

IN TWO CHAPTERS. CHAPTER I.

Φῶς, phōs, light, and its genitive case, φωτὸς, phōtŏs, of light, are the root whence several ancient and modern words have sprung. Phosphorus, in Latin Lucifer or the Light-bringer, was once the morning star, the planet Venus when she shines before daybreak and ushers in the dawn. Phosphorus, now, is a substance so called because it carries light with it, or is self-luminous, in distinction to substances which shine only when they burn with sensible heat, as wood, coal, candle, oil, and gas. Phosphorescent bodies—certain stale fish, the tail of the glow-worm, the head of the fire-fly, centipedes, and other creeping things at special seasons, the waves of the sea—are such as give out light without undergoing appreciable combustion. A photometer is a measure of the intensity of light; a photograph is a writing or picture drawn by the agency of light. Photology may be taken to be the history, description, and explanation of the theories and facts relating to light. With the rapid progress which the science is making, it is probable that before long the word "photological" will become as familiar to our ears as its popular congener, "geological."

Photological phenomena are made known to us by what is called the sense of sight, but which, the more we think about it, assumes more and more the nature of an intellectual faculty rather than of a gross corporeal sensation. As the brain is the instrument and medium of thought, so the retina of the eye is the instrument and medium of vision. Wound a man's retina, he ceases to see; oppress his brain, and he loses thought and consciousness. Sight is consciousness, observation, reason, extended and applied to indefinite distances and depths. Sight, quite as much as speech, is the means of interchanging thought, the channel of communication between soul and soul. Nay, it is more so. Sight enables us to learn and comprehend what passed in the minds of the bygone dead. Their impressions, reasonings, and conclusions, are treasured up for us in books, which sight alone permits us to decipher and interpret; for characters printed in relief, to help the blind to spell and read, are only an accidental corollary to the previous original gift of sight. It may be fairly assumed that no blind man would ever invent an alphabet. Moreover, without uttering a word, two pairs of eyes shall exchange glances and signs conveying a hundred different meanings.

The sense of hearing allows mind to hold intercourse with mind, through material, mechanical ponderable means—the air and the sound-waves in it which are excited by every sonorous body. You can often *see* the vibratory mechanism which produces sound; as in a harp-string, the rim of a very large bell, in a drum-head, a tuning-fork, and many other instances. And when you cannot actually behold it, its action is betrayed by the motions of dust or sand scattered upon the sounding body. You *feel* it when the pedal pipe of an organ makes you tremble by the utterance of its deep sympathetic note. But sight places us in direct communication with every visible thing around us, and more—with the souls of our fellow-men, with the humbler reason and instincts of animals, with the world of plants, with the living mass of ocean, and with inert matter mightier in magnitude than Pelion ten times piled on Ossa—and all through an imponderable agent, light, which we cannot conceive to be material, since it traverses with marvellous rapidity and without injuring them or leaving a trace, solid bodies of great hardness and density, diamond, crystal, glass, and ice. Light may either be an emanation, a something darted out from the sun and other luminous bodies, or it may be undulations in an ether (so subtle that we can hardly call it material) which must pervade all space, and—what is more difficult to comprehend—must penetrate all transparent bodies. But whether emission or undulation be the actual means by which light is propagated, for us the grand and blessed fact remains that the Creator has said, "Let there be light!" There *is* light.

It is in the faculty of sight that we make the nearest approach to the condition of spiritual beings; whom we figure to ourselves as intelligences endowed with perception, but unencumbered with the burden of bodily frames and frailties. We suppose them to behold, and watch, and take cognisance; to gaze with adoration at their Maker's perfections, and to look down with pity on the sorrows of men; but to be subject to no really corporeal pain, pleasure, or infirmity.

Milton, indeed, makes Satan

——first know pain,
And writh'd him to and fro convolv'd,

when Michael's

——sword with discontinuous wound
Pass'd through him. But th' ethereal substance clos'd
Not long divisible.

And

Soon he heal'd; for spirits that live throughout
Vital in every part, not as frail man
In entrails, heart or head, liver or reins,
Cannot but by annihilating die;
Nor in their liquid texture mortal wound
Receive, no more than can the fluid air.
All heart they live, all head, all eye, all ear,
All intellect, all sense: and as they please,
They limb themselves; and colour, shape or size
Assume, as likes them best, condense or rare.

It may be asserted, at any rate, that, of all our senses, sight is the least sensuous. A pleasant sight pleases us in quite a different way to that in which an agreeable perfume, a deli-

cious fruit, a genial warmth, and even harmonious sounds please us. It is a pleasure afforded *to the mind*. A painful sight gives pain which has no analogy to the annoyance caused by a disgusting stench, a nauseous drug, a severe burn, or a discordant noise, such as the sharpening of a saw, which sets the hearer's teeth on edge, and makes cold water run down his back. A sight may be so painful and agonising as to render the seer motionless and deadly cold; to cause vomiting, congestion of the brain, apoplexy, convulsions, and even death. But it exerts that powerful influence solely through the effect of mental emotion. It is the soul only which suffers first, although its suffering acts afterwards upon the body.

Light further resembles thought, in *not* acting instantaneously. We say "as quick as thought;" and we may say, if we please, "as quick as light," with equal truth. But light takes *time* to travel from one point to another, however inappreciable to us that infinitesimal period of time may be. Thought, likewise, takes time to evolve itself, whether our intention in thinking be to recal the past, to imagine a fiction, or to form a judgment. To collect our thoughts, is a work of time. Intricate reasonings, logical conclusions, poems, romances, pictorial and other artistic conceptions, require time for their elaboration, and are not flashed off with the suddenness of a miracle. So also it is with the transmission of light.

The sense of sight, which we owe to the existence of light, endows us even, through its agency, with an approach to the gift of ubiquity. By sight, we dart our own personality to various different points in rapid succession; we become aware of distant objects and events; and yet we remain, all the while, wherever we happen to be in bodily presence. We are witnesses to, and are immediately present at, all that passes within the range of our ken.

Consider well the enormous difference between the man born blind and the man whom Providence has blessed with sight. The blind man's is an isolated intelligence. His knowledge of what exists, and of what is going on, around him, is exceedingly limited—confined to what he can touch, and feel, and perceive with his grosser bodily senses. Sound even can give him information of events taking place only throughout a quite restricted extent of space. Of facts and phenomena which have their seat beyond the limits of the terrestrial sphere, he can have no cognisance—scarcely a conception. The atmosphere is very partially open to his observation. The wind he can feel, and the thunder he can hear; rain will wet him, and snow will chill him: but what notion can he form of the lightning's flash; of clouds, and their varieties; of fog and rime; of sunsets, auroræ boreales, and shooting stars? He is apprised of the sun's existence, exactly as he is of that of his kitchen fire; namely, by the warmth which sunshine impresses upon his skin. Of the sun riding in the heavens, of the solar system of planets and satellites, of the starry firmament, however well described and explained to him, he can merely form a vague and incomplete idea. Nay, he would be quite excusable in entertaining doubts as to the reality of the wonders described to him. The blind man has not even circumstantial evidence to prove the truth of much to which he is required to give credence. For seeing only is, if not thoroughly believing, at least complete perception and understanding.

A blind man, as far as observation is concerned, is, mentally, a mathematical point. He has no observant breadth, nor length, nor thickness. However bright his intellect, it must remain a mere speck, concentrated in one focus, without power of radiating outwards, or of receiving radiation from without. So that sight is the most grasping and comprehensive of all our senses, as well as the most spiritual and intellectual in its functions. Through it we learn what motion really is; space becomes to us a fact, instead of a puzzle; and, by it, we are enabled to admit, though we cannot quite hold it in our mental clutch, the meaning of the word Infinity. Within its own range, it makes us omnipresent.

Standing on an eminence, with one of Nature's grand panoramas before us, sight empowers us to assimilate the whole, as if it were a part of our own individuality. We drink in the landscape with our eyes. We embrace every detail. We are instantly present at every locality included within our vast horizon. We follow the windings of the stream. We leap, with the cascade, from rock to rock. We track the changes in the forest, verifying the altered features brought about by increase of altitude. We mark where oak and beech give way to fir; where stunted shrubs can climb no further; and where naked storm-rent peaks tower above all.

There are mountains on whose inaccessible summit human foot has never yet trod. Notwithstanding which, we, who enjoy the gift of sight, know them, and what is happening about them, as if they lay in our daily track. We are as sure of the nature of their slippery ice-fields, their perpendicular precipices, and their treacherous snows, as if we had tested each by handling. Not a mist, however light, can curl round their apex, or repose on their side, without our being informed of it by an unfailing telegraph which reaches where no other telegraph can climb.

But our consciousness is able to throw itself to distances far beyond the mountain-tops. We know whether the earth is wrapped around by a mantle of clouds in the heights of the atmosphere, or whether no condensed vapour is held suspended in the whole azure abyss which lies between us and the moon. Beyond the moon, we travel onwards; and, with the chronometer which we hold in our hand, we measure movements whose scene of action is removed by an interval which would take us months and years to traverse in person, even if we pursued our way at cannon-ball speed, incessantly. As certain as we are that the hands of the clock on our chimney piece complete their round, one

in sixty seconds, another in sixty minutes, and another in twelve hours; so certain may we be that Saturn's nearest satellite rushes round its parent planet in less than a day, at the very short distance of not two of the planet's diameters, while Jupiter's corresponding moon takes more than a day and a half (brief space enough), at the height of three diameters in the sky, to complete the tour of *her* central world. The revolutions of those satellites, we feel quite assured, are no more a deception, an optical illusion, than the balls which a juggler keeps circling in the air a couple of yards in front of us.

To extend our discoveries beyond the solar system, the reader here shall be reminded of what he may have read before.* Light, we know, may be dissected. A sunbeam darting through a keyhole, and falling on a triangular prism of glass, is resolved into separate rays, which give the respective colours of the rainbow. The ray, so far analysed, is called the prismatic spectrum, and forms an oblong stripe or image of coloured light. From Newton's time until quite lately, the dissection of the spectrum went no further.

By skilful observations with prisms, Dr. Wollaston, and afterwards Herr Fraunhofer, discovered that the oblong image, obtained by decomposing sunlight, was crossed in various places by dark lines, which always occupy the same relative position when the prismatic spectrum is obtained from the sun; while the light, either from fixed stars or from artificial sources, gives a spectrum either without lines, or crossed by lines occupying different positions. The important point was, that the position and number of the lines were invariably the same when the light was obtained from the same source. These lines were called Fraunhofer's lines, and so the matter rested for a while.

But recently, the discovery was made that various mineral substances, entering into flame or fire, not only alter the colour of the flame, but cause a variation in the spectrum obtained from the light given out. Such variations were found so constant and unfailing in betraying the presence of that substance in the flame, that they allowed the practice of a new mode of analysis, consequently called spectral analysis. Thus sodium, the metallic basis of common salt, mixed with burning combustibles, gives a ghastly yellow colour to the flame, and a peculiar marking to the spectrum. It shows a single vivid yellow band, due to the combustion of the metal. Every other combination in which the same metal exists, always produces the same result; so that by the presence or absence of the particular band of colour which belongs to sodium, the presence or absence of that metal can be detected with perfect certainty. The same is true of calcium, the metallic base of lime, and other like substances; also of copper and the other ordinary metals, each of which communicates a colour to flame, and exhibits its own proper bands in the spectrum.

Spectral analysis, thus briefly sketched, has been employed to examine the light of the sun; and it reveals to us the fact that the sun contains a number of metals identical with those which are found on earth. This delicate but certain mode of investigation, which we owe to Messrs. Kirchhoff and Bunsen, has since been applied to the still more difficult task of ascertaining the constitution of the nebulæ.

The nebulæ are cloud-like luminous bodies, of various shape, shining with a pale uncertain glimmer, some of which have been calculated by Sir John Herschel to be situated at such enormous distances, that their light takes no less than two millions of years to travel from them to our earth. Some few (as the nebula in the constellation Andromeda, and the Magellanic clouds which revolve round the South Pole) are visible to the naked eye; but the greater majority are telescopic objects. The study of the nebulæ followed the invention of the telescope. *What* are they? That is the question.

In 1612, four years after the accidental discovery of the telescope, Simon Marius described the nebula in Andromeda. In 1656, Huyghens traced the image of that which is observed in the sword of Orion. These two clouds, Humbolt says, might be regarded as a more or less advanced condensation of vapoury matter and cosmic nebulosity. Marius, when he compares the nebula in Andromeda to the light of a candle seen through a semi-transparent body, clearly indicates the difference which exists between the nebulæ properly so called and the clusters of stars more or less distinct, such as the Pleiades and others, observed by Galileo.

Galileo, not considering the nebula of Andromeda worthy of any special attention—although the most powerful instruments have not yet discovered in it any stars—took *all* nebulæ, and the Milky Way itself, for luminous clusters of stars huddled close together. He made no distinction between what is cloud and what is stars, as Huyghens did in the nebula of Orion.

Since those days, it is to William Herschel that we owe the greater part of our knowledge respecting the nebulæ. According to him, they cover one two-hundred-and-seventieth part of the whole visible firmament. The number of nebulæ whose place has been determined in right ascension and declination, already exceeds three thousand six hundred. All of these, seen through a telescope, appear, at the first glance, completely different from the other heavenly bodies. But in proportion as the means of observation are increased by the construction of more and more powerful instruments, it is found possible to *resolve* an increasing number of nebulæ; i.e. to ascertain that many of these luminous masses *are*, as Galileo supposed, accumulations of stars crowded together, whose minuteness (in consequence of their prodigious

* See Recent Discoveries concerning Light, in vol. v., page 270.

distance) causes the stars to appear confused to our unassisted eye.

At one time, the results achieved by Lord Rosse's gigantic telescope, gave rise to expectations that *all* the nebulæ might be resolved. It was confidently asserted that if any doubt was still entertained respecting their resolvability, that doubt was very small indeed. At a later period, nevertheless, Lord Rosse had not yet completely succeeded in resolving the whole of Orion's nebula; he expressed his hopes of being able to do so, and that was all. In spite of similar efforts made by other astronomers, there still remain nearly four thousand unresolved nebulæ; that is, nebulæ in which it has not been possible to ascertain the existence of distinct luminous bodies—of stars, in short.

Two hypotheses have been started about the nebulæ. One assumes them to be clusters of stars, so distant that their light becomes confused into a faint blot or blur, which only requires instruments of sufficient power to show the separate stars of which it is composed. Each nebula was taken to be a little, or rather a partial universe, complete in itself. This theory, originally held by Galileo and Cassini, has Lord Rosse, Herschel, and others, amongst its modern supporters.

Other not less illustrious astronomers, as Halley, Kepler, and Tyco Brahe, have maintained that true nebulæ do not consist of stars. It is assumed that there exist in the heavenly spaces luminous masses of cloudy matter, which, by slow and gradual condensation, ultimately become stars. According to this theory, the impossibility of resolving certain nebulæ is owing, not to the weakness of our telescopes, but to the very nature of the object viewed. The well-ascertained variations of the forms and dimensions of certain nebulæ, the assurance acquired by science that there exist heavenly bodies of all dimensions and all densities, the excessively slight density of the comets, and the known laws of attraction, are so many presumptions which argue in favour of this second hypothesis. Its extreme probability has been further confirmed by the application of the spectral analysis.

It was a bold idea for weak and ephemeral man to investigate the nature of bodies outlying on the uttermost verge of visible space, and belonging to long-expired epochs of time. These nebulæ, whose light is now being analysed—these stars in which we have ascertained the presence of a number of earthly elements—may have been extinguished, perhaps, for thousands of years, or may have gone to illuminate other regions of the heavens. In consequence of their prodigious distance, and the time their light requires to reach us, we may see them here after they have ceased to shine. Sight thus carries us back into periods of distant time, just as it conveys us forward into regions of distant space. We see distinctly, with our own living eyes, what was happening ages ago. The stars are for us, according to Humboldt's expression, the voices of the past wafted back to us.

In November last, Mr. Huggins read before the Royal Society an account of his experiments on the light of the nebulæ. Spectral analysis had already taught us that, with the exception of a few trifling differences, a great number of the fixed stars possess a physical constitution identical with that of the sun. Consequently, prismatic observation would appear to be the best means of determining whether there exist any essential difference between the fixed stars and the nebulæ—either in the nature of the matters composing them, or in the conditions under which their light is emitted. In short, this ingenious method promised to resolve the problem whether the structure of the nebulæ is comparable to that of planets and stars; or whether they are mere vapour without any nucleus or denser consistency, and composed solely of cosmic matter of excessively feeble density.

This is scarcely the place to describe the arrangement of Mr. Huggins's optical apparatus. He selected for examination the nebulæ which offer small round or elliptical disks, and which Sir John Herschel classed as planetary nebulæ. There is little probability of their being resolvable. Their colour is green, and sometimes blue, and they present no sign of central condensation. The first examined was a nebula of the Dragon. Its light, unlike that of all other extra-terrestrial bodies, is not composed of rays having different degrees of refrangibility, and therefore does not form a spectrum. It is in great part monochromatic—that is, of one single colour; and after passing through the prism, it remains concentrated in one brilliant line. Careful examination discovered, besides, a second bright line separated from the first by a dark interval; and afterwards, a third bright line, but much fainter than the other two. The position of the first corresponds to azote; that of the second to hydrogen; the third appears to belong to some unknown element. It is close to one of the brilliant stripes observed in the spectrum of baryum.

In the majority of the other nebulæ examined, the three bright rays have been seen in the same position; in some few, a fourth stripe has been remarked.

Such nebulæ, our astronomer believes, can no longer be regarded as clusters of suns resembling our sun and the fixed stars in their constitution, but as stars or astral bodies of a distinct form and peculiar constitution. Instead of being incandescent bodies, in a solid or a liquid state, transmitting light of various refrangibilities through an atmosphere which intercepts a certain number of rays—which appears to be the constitution of our sun—they (or at least their luminous surface) ought probably to be considered as enormous masses of gas or luminous vapour. As far as we know, it is only by matter in a gaseous state that light can be emitted, having so limited a degree of refrangibility. The extreme simplicity of the structure of one of these nebulæ is indicated by the three bright stripes, if we regard them as denoting the pre-

sence of azote, hydrogen, and some unknown substance only.

Spectral analysis, therefore, renders probable the hypothesis of a cosmic matter whose successive condensation has given birth to the worlds which revolve in space. It supports Laplace's theory of the origin of our solar system; that the nebulæ are suns in the course of formation; and that the organisation of matter is still going on before our eyes, although at distances inconceivable by the human mind.

THE REMEMBRANCES OF A CORNISH VICAR.

It has frequently occurred to my thoughts, that the events which have befallen me since my collation to this wild and remote vicarage, on the shore of the billowy Atlantic sea, might not be without interest to the reader of a more refined and civilised region. When I was collated to the incumbency in 18—, I found myself the first resident vicar for more than a century. My parish was a domain of about seven thousand acres, bounded, on the landward border, by the course of a curving river, which had its source in a sister-stream in a moorland spring within my territory, and flowing southward, divided two counties in its descent to the sea. My seaward boundary was a stretch of bold and rocky shore, an interchange of lofty headland and deep and sudden gorge, the cliffs varying from three hundred to four hundred and fifty feet of perpendicular or gradual height, and the valleys gushing with torrents, which bounded rejoicingly towards the sea, and leaped at last, amid a cloud of spray, into the waters. So stern and pitiless is this iron-bound coast, that within the memory of one man upwards of eighty wrecks have been counted within a reach of fifteen miles, with only here and there the rescue of a living man. My people were a mixed multitude of smugglers, wreckers, and dissenters of various hue. A few simple-hearted farmers had clung to the grey old sanctuary of the church and the tower that looked along the sea, but the bulk of the people, in the absence of a resident vicar, had become the followers of the great preacher of the last century, who came down into Cornwall and persuaded the people to alter their sins. I was assured, soon after my arrival, by one of his disciples, who led the foray among my flock, that my "parish was so rich in resources for his benefit, that he called it, sir, the garden of our circuit." The church stood on the glebe, and close by the sea. It was an old Saxon station, with additions of Norman structure, and the total building, although of gradual erection, had been completed and consecrated before the middle of the fifteenth century. The vicarage, built by myself, stood, as it were, beneath the sheltering shadow of the walls and tower. My land extended thence to the shore. Here, like the Kenite, I had "built my nest upon the rock," and here my days were to glide away afar from the noise and bustle of the world, in that which is perhaps the most thankless office in every generation, the effort to do good against their will to our fellow-men. Mine was a perilous warfare. If I had not, like the apostle, to "fight with wild beasts at Ephesus," I had to soothe the wrecker, to persuade the smuggler, and to "handle serpents," in my intercourse with adversaries of many a kind. Thank God! the promises which the clergy inherit from their founder cannot fail to be fulfilled. It was never prophesied that they should be popular, or wealthy, or successful among men; but only that they "should endure to the end," that "their generation should never pass away." Well has this word been kept!

Among my parishioners there were certain individuals who might be termed representative men; quaint and original characters, who embodied in their own lives the traditions and the usages of the parish. One of these had been for full forty years a wrecker; that is to say, a watcher of the sea and rocks for flotsam and jetsam, and other unconsidered trifles which the waves might turn up to reward the zeal and vigilance of a patient man. His name was Peter Burrow, a man of harmless and desultory life, and by no means identified with the cruel and covetous natives of the strand, with whom it was a matter of pastime to lure a vessel ashore by a treacherous light, or to withhold succour from the seaman struggling with the sea. He was the companion of many of my walks, and the witness, with myself, of more than one thrilling and perilous scene. Another of my parish notorieties, the hero of contraband adventure, and agent for the sale of smuggled cargoes in bygone times, was Tristam Pentire, a name already known to the readers of these pages under their former name of Household Words. With a merry twinkle of the eye, and in a sharp and ringing tone, it was old Tristam's usage to recount for my instruction such tales of wild adventure, and of "derring do," as would make the foot of an exciseman falter, and his cheek turn pale. But both these cronies of mine were men devoid of guile; and in their most reckless of escapades innocent of mischievous harm. It was not long after my arrival in my new abode, that I was plunged all at once into the midst of a fearful scene of the terrors of the sea. About daybreak of an autumn day I was aroused by a knock at my bedroom door; it was followed by the agitated voice of a boy, a member of my household, "O, sir, there are dead men on Vicarage Rocks."

In a moment I was up, and in my dressing-gown and slippers rushed out. There stood my lad, weeping bitterly, and holding out to me in his trembling hands a tortoise alive. I found afterwards that he had grasped it on the beach, and brought it in his hand as a strange and marvellous arrival from the waves, but in utter ignorance of what it might be. I ran across my glebe, a quarter of a mile, to the cliffs, and

down a frightful descent of three hundred feet to the beach. It was indeed a scene to be looked on once only in a human life. On a ridge of rock, just left bare by the falling tide, stood a man, my own servant; he had come out to see my flock of ewes, and had found the awful wreck. There he stood, with two dead sailors at his feet, whom he had just drawn out of the water stiff and stark. The bay was tossing and seething with a tangled mass of rigging, sails, and broken fragments of a ship; the billows rolled up yellow with corn, for the cargo of the vessel had been foreign wheat; and ever and anon there came up out of the water, as though stretched out with life, a human hand and arm. It was the corpse of another sailor drifting out to sea. "Is there no one alive?" was my first question to my man. "I think there is, sir," he said, "for just now I thought I heard a cry." I made haste in the direction he pointed out, and on turning a rock, just where a brook of fresh water fell towards the sea, there lay the body of a man in a seaman's garb. He had reached the water, faint with thirst, but was too much exhausted to swallow or drink. He opened his eyes at our voices, and as he saw me leaning over him in my cassock-shaped dressing-gown, he sobbed, with a piteous cry, "Oh, mon père, mon père!" Gradually he revived, and when he had fully come to himself with the help of cordials and food, we gathered from him the mournful tale of his vessel and her wreck. He was a Jersey man by birth, and had been shipped at Rio, on the homeward voyage of the vessel from the port of Odessa with corn. I had sent in for brandy, and was pouring it down his throat, when my parishioner, Peter Barrow, arrived. He assisted, at my request, in the charitable office of restoring the exhausted stranger, but when he was refreshed and could stand upon his feet, I remarked that Peter did not seem so elated as in common decency I expected he would be. The reason soon transpired. Taking me aside, he whispered in my ear, "Now, sir, I beg your pardon, but if you'll take my advice, now that the man is come to himself, if I were you I would let him go his way wherever he will. If you take him into your house, he'll surely do you some harm." Seeing my surprise, he went on to explain. "You don't know, sir," he said, "the saying on our coast:

> Save a stranger from the sea,
> And he'll turn your enemy.

There was one Coppinger cast ashore from a brig that struck up at Hartland, on the Point. Farmer Hamlyn dragged him out of the water and took him home, and was very kind to him. Lord, sir, he never would leave the house again. He lived upon the folks a whole year, and at last, lo and behold! he married the farmer's daughter Elizabeth, and spent all her fortin rollicking and racketing, till at last he would tie her to the bedpost and flog her till her father would come down with more money. The old man used to say he wished he'd let Coppinger lie where he was in the waves, and never laid a finger on him to save his life. Ay, and divers more I've heerd of that never brought no good to they that saved them."

"And did you ever yourself, Peter," said I, "being, as you have told me, a wrecker so many years—did you ever see a poor fellow clambering up the rock where you stood, and just able to reach your foot or hand, did you ever shove him back into the sea to be drowned?"

"No, sir, I declare I never did. And I do believe, sir, if I ever had done such a thing, and given so much as one push to a man in such a case, I think verily that afterwards I should have been troubled and uncomfortable in my mind."

"Well, notwithstanding your doctrine, Peter," said I, "we will take charge of this poor fellow, so do you lead him into the vicarage and order a bed for him, and wait till I come in." I returned to the scene of death and danger, where my man awaited me. He had found, in addition to the two corpses, another dead body, jammed under a rock. By this time, a crowd of people had arrived from the land, and at my request they began to search anxiously for the dead. It was, indeed, a terrible scene. The vessel, a brig of five hundred tons, had struck, as we afterwards found, at three o'clock that morning-night, and by the time the wreck was discovered she had been shattered into broken pieces by the fury of the sea. The rocks and the water bristled with fragments of mast and spar and rent timbers; the cordage lay about in tangled masses. The rollers tumbled in volumes of corn, the wheaten cargo; and amidst it all the bodies of the helpless dead, that a few brief hours before had walked the deck the stalwart masters of their ship, turned their poor disfigured faces toward the sky, pleading for sepulture. We made a temporary bier of the broken planks, and laid thereon the corpses, decently arranged. As the vicar, I led the way, and my people followed with ready zeal as bearers, and in sad procession we carried our dead up the steep cliff, by a difficult path, to await, in a room at my vicarage which I allotted them, the inquest. The ship and her cargo were, as to any tangible value, utterly lost.

The people of the shore, after having done their best to search for survivors and to discover the lost bodies, gathered up fragments of the wreck for fuel, and shouldered them away; not, perhaps a lawful spoil, but a venial transgression when compared with the remembered cruelties of Cornish wreckers. Then ensued my interview with the rescued man. His name was Le Daine. I found him refreshed, and collected, and grateful. He told me his Tale of the Sea. The captain and all the crew but himself were from Arbroath, in Scotland. To that harbour also the vessel belonged. She had been away on a two years' voyage, employed in the Mediterranean trade. She had loaded last at Odessa. She touched at Rio, and there Le Daine, who had been sick in the hospital, but recovered, had joined her. There, also, the captain had

engaged a Portuguese cook, and to this man, as one link in a chain of causes, the loss of the vessel might be ascribed. He had been wounded in a street quarrel the night before the vessel sailed from Rio, and lay disabled and useless in his cabin throughout the homeward voyage. At Falmouth, whither they were bound for orders, the cook died. The captain and all the crew, except the cabin-boy, went ashore to attend the funeral. During their absence the boy, handling in his curiosity the barometer, had broken the tube, and the whole of the quicksilver had run out. Had this instrument, the pulse of the storm, been preserved, the crew would have received warning of the sudden and unexpected hurricane, and might have stood out to sea. Whereas, they were caught in the chops of the Channel, and thus, by this small incident, the vessel and the mariners found their fate on the rocks of a remote headland in my lonely parish. I caused Le Daine to relate in detail the closing events.

"We received orders," he said, "at Falmouth to make for Gloucester to discharge. The captain, and mate, and another of the crew, were to be married on their return to their native town. They wrote, therefore, to Arbroath from Falmouth, to announce their safe arrival there from their two years' voyage, their intended course to Gloucester, and their hope in about a week to arrive at Arbroath for welcome there."

But in a day or two after this joyful letter, there arrived in Arbroath a leaf torn out of my pocket-book, and addressed "To the Owners of the Vessel," with the brief and thrilling tidings written by myself in pencil, that I wrote among the fragments of their wrecked vessel, and that the whole crew, except one man, were lost "upon my rocks." My note spread a general dismay in Arbroath, for the crew, from the clannish relationship among the Scotch, were connected with a large number of the inhabitants. But to return to the touching details of Le Daine.

"We rounded the Land's End," he said, "that night all well, and came up Channel with a fair wind. The captain turned in. It was my watch. All at once, about nine at night, it began to blow in one moment as if the storm burst out by signal; the wind went mad; our canvas burst in bits. We reeved fresh sails; they went also. At last we were under bare poles. The captain had turned out when the storm began. He sent me forward to look out for Lundy Light. I saw your cliff." (This was a bluff and broken headland just by the southern boundary of my own glebe.) "I sung out, Land. I had hardly done so when she struck with a blow, and stuck fast. Then the captain sung out, 'All hands to the maintop,' and we all went up. The captain folded his arms, and stood by, silent."

Here I asked him, anxious to know how they expressed themselves in such a time, "But what was said afterwards, Le Daine?"

"Not one word, sir; only once, when the long boat went over, I said to the skipper, 'Sir, the boat is gone.' But he made no answer."

How accurate was Byron's painting:

Then shrieked the timid, and stood still the brave.

"At last there came on a dreadful wave, mast-top high, and away went the mast by the board, and we with it, into the sea. I gave myself up. I was the only man on the ship that could not swim, so where I fell in the water there I lay. I felt the waves beat me and send me on. At last there was a rock under my hand. I clung on. Just then I saw Alick Kant, one of our crew, swimming past. I saw him lay his hand on a rock, and I sung out, 'Hold on, Alick!' but a wave rolled and swept him away, and I never saw his face more. I was beaten onward and onward among the rocks and the tide, and at last I felt the ground with my feet. I scrambled on. I saw the cliff, steep and dark, above my head. I climbed up until I reached a kind of platform with grass, and there I fell down flat upon my face, and either I fainted away or I fell asleep. There I lay a long time, and when I awoke it was just the break of day. There was a little yellow flower just under my head, and when I saw that I knew I was on dry land." This was a plant of the Bird's-foot clover, called in old times Our Lady's Finger. He went on: "I could see no house or sign of people, and the country looked to me like some wild and desert island. At last I felt very thirsty, and I tried to get down towards a valley where I thought I should find water. But before I could reach it I fell and grew faint again, and there, thank God, sir, you found me."

Such was Le Daine's sad and simple story, and no one could listen unmoved or without a strong feeling of interest and compassion for the poor solitary survivor of his shipmates and crew. The coroner arrived, held his 'quest, and the usual verdict of "Wrecked and cast ashore," empowered me to inter the dead sailors, found and future, from the same vessel, with the service in the Prayer Book for the Burial of the Dead. This decency of sepulture is the result of a somewhat recent statute, passed in the reign of George the Third. Before that time, it was the common usage of the coast to dig, just above high-water mark, a pit on the shore, and therein to cast, without inquest or religious rite, the carcases of shipwrecked men. My first funeral of these lost mariners was a touching and striking scene. The three bodies first found were buried at the same time. Behind the coffins, as they were solemnly borne along the aisle, walked the solitary mourner, Le Daine, weeping bitterly and aloud. Other eyes were moist, for who could hear unsoftened the greeting of the Church to these strangers from the sea? and the "touch that makes the whole earth kin," in the hope we breathed that we, too, might one day "rest as these our brethren did"? It was well-nigh too much for those who served that day. Nor was the interest subdued when, on the Sunday after the wreck, at the appointed place in the service, just before the General Thanksgiving, Le Daine rose up from his place, approached the altar, and uttered in

an audible but broken voice, his thanksgiving for his singular and safe deliverance from the perils of the sea.

The text of the sermon that day demands its history. Some time before, a vessel, the Hero of Liverpool, was seen in distress, in the offing of a neighbouring harbour, during a storm. The crew, mistaking a signal from the beach, betook themselves to their boat. It foundered, and the whole ship's company, twelve in number, were drowned in sight of the shore. But the stout ship held together, and drifted on to the land, so unshattered by the sea, that the coast-guard, who went immediately on board, found the fire burning in the cabin. When the vessel came to be examined, they found in one of the berths a Bible, and between its leaves a sheet of paper, whereon some recent hand had transcribed verses the twenty-first, twenty-second, and twenty-third of the thirty-third chapter of Isaiah. The same hand had also marked the passage with a line of ink along the margin. The name of the owner of the book was also found inscribed on the fly-leaf. He was a youth of eighteen years of age, the son of a widow, and a statement under his name recorded that the Bible was "a reward for his good conduct in a Sunday school." This text, so identified and enforced by a hand that soon after grew cold, appeared strangely and strikingly adapted to the funeral of ship-wrecked men; and it was therefore chosen as the theme for our solemn day. The very hearts of the people seemed hushed to hear it, and every eye was turned towards Le Daine, who bowed his head upon his hands and wept. These are the words: "But there the glorious Lord will be unto us a place of broad rivers and streams; wherein shall go no galley with oars, neither shall gallant ship pass thereby. For the Lord is our judge, the Lord is our lawgiver, the Lord is our king; he will save us. Thy tackle-lings are loosed; they could not well strengthen their mast, they could not spread the sail: then is the prey of a great spoil divided; the lame take the prey." Shall I be forgiven for the vaunt, if I declare that there was not literally a single face that day unmoistened and unmoved? Few, indeed, could have borne, without deep emotion, to see and hear Le Daine. He remained as my guest six weeks, and during the whole of this time we sought diligently, and at last found the whole crew, nine in number. They were discovered, some under rocks, jammed in by the force of the water, so that it took sometimes several ebb-tides, and the strength of many hands, to extricate the corpses. The captain I came upon myself, lying placidly upon his back, with his arms folded in the very gesture which Le Daine had described as he stood amid the crew on the maintop. The hand of the spoiler was about to assail him, when I suddenly appeared, so that I rescued him untouched. Each hand grasped a small pouch or bag. One contained his pistols; the other held two little log reckoners of brass; so that his last thoughts were full of duty to his owners and his ship, and his latest efforts for rescue and defence. He had been manifestly lifted by a billow and hurled against a rock, and so slain; for the victims of our cruel sea are seldom drowned, but beaten to death by violence and the wrath of the billows. We gathered together one poor fellow in five parts; his limbs had been wrenched off, and his body rent. During our search for his remains, a man came up to me with something in his hand, inquiring, "Can you tell me, sir, what this is? Is it a part of a man? It was the mangled seaman's heart, and we restored it reverently to its place, where it had once beat high with life and courage, with thrilling hope and sickening fear. Two or three of the dead were not discovered for four or five weeks after the wreck, and these had become so loathsome from decay, that it was at peril of health and life to perform the last duties we owe to our brother-men. But hearts and hands were found for the work, and at last the good ship's company, captain, mate, and crew, were laid at rest, side by side, beneath our churchyard trees. Groups of grateful letters from Arbroath are to this day among the most cherished memorials of my escritoire. Some, written by the friends of the dead, are marvellous proofs of the good feeling and educated abilities of the Scotch people. One from a father breaks off in irrepressible pathos, with a burst of "O my son! my son!" We placed at the foot of the captain's grave the figure-head of his vessel. It is a carved image, life-size, of his native Caledonia, in the garb of her country, with sword and shield.

"LEFT HIS HOME."

He left us all one bright June dawn,
Taking his watch down from the nail,
Just as he always used to do;
Leaning his hoe against the rail
As he turned round to kiss our George
(Who ran to push the gate), and bent
A curious kind of look at me
And little Bessy, as he went.

He picked a tuft of hollyhock,
Then gave a sigh, and one more look,
As 'yont the elm-tree in the lane
The shuddering willows three times shook.
I heeded not the warning then.
'Twas ten years since, this very day,
That Robert left us all alone,
And took yon path, the Hindon way.

Sometimes, when 'mid the brooding mists
That shroud the valley and the lake,
Looms through the golden harvest moon,
And glows o'er down, and hill, and brake,
I think I see him in the dusk,
When George is playing at the door,
And spring to meet his welcoming arms,
As I have done so oft before.

Or some morn in the harvest-time,
As when he left me, he will come,
Meeting me down a row of sheaves;
And we shall hurry laughing home,

And wake our boy with kisses, then
He'll take his favourite seat and tell
Of his mysterious wanderings,
And what the day he left befel.

Sometimes I dream I see a man,
His back towards me, by a brook
Full of swift-darting trout, whose fins
Flash past the weed-drifts as I look.
A dying fish flaps on the grass—
Then, led by something that I see,
I steal still closer to his side:
He turns. O, gracious God, 'tis he!

Or—think not of it, my worn heart,
Some winter's night, when I am old,
There'll come a beggar lame and bent,
And pale and shivering with the cold.
And when I bring him to the fire,
He'll call me by the fondling name
He used to twenty years ago,—
O, should I know him if he came?

Dear George, if father should return
When I am under churchyard grass,
Tell him how oft I spoke of him,
And take him out that he may pass
Near where I lie asleep, and see
If the tears fall for her he left.
O, agony of lingering grief!—
Yet, George, I am not quite bereft.

ARTIFICIAL FERTILITY.

Amongst the tens of thousands of Englishmen who daily consume their allowance of flour and flesh, the majority believe that grass grows without care, and that if land be ploughed or digged and sown, a profitable crop will follow as a matter of course. On the other hand, a select and semi-scientific few, in equal ignorance, denounce the stupidity of modern farmers, and rhapsodise (out of a book they do not understand) on some scheme for carrying the fertilisers of hundreds of acres in a waistcoat-pocket, or for converting into a revenue counted in millions, the black streams that flow through the sewers of our great cities. Yet there is a spice of truth in both these crude notions.

In a new country, where land is cheap and labour dear, colonists naturally settle on the most fertile soils. In the more genial climates, on such soils the rudest cultivation will produce an abundant corn crop. The settler in the Western States of America and in Australia digs a hole with his hoe, scatters, and covers up a few seeds, measures the length of the hoe's handle, repeats the process, and, with no more trouble, in due time gathers an ample return of Indian corn. In India and China, if the soil be merely scratched and irrigated, almost any crop may be grown. The tropical air is loaded with the elements of fertility.

Not so in our colder and long-cultivated latitudes. There the rich alluvial soils which yield richly year after year without artificial assistance, are rare and precious. The great mass of the farm-land of this country gives back in proportion as it receives, requiring, to make the most profitable return, not only careful cultivation by hand, or horse, or steam power, or all and other mechanical aids to fertility, but a constant liberal supply of home-made or purchased manure, and purchased food for their live stock—generally of all three.

From very early ages, all cultivating tribes have, more or less, imperfectly attempted to maintain and increase the fertility of soils by two modes—by rest, or, speaking technically, by fallow, and by manure. On a great part of the farm-land of France and Germany half is alternately in fallow. These two methods were used for thousands of years before chemists discovered what it was that manure gave back to the soil, and why certain soils were reinvigorated by a cessation of cropping. The Chinese practised manuring before Rome was built, but the climate of China, especially as regards rainfall and sun, removes that country from any useful comparison with European culture. The Romans, the most careful and exact of agriculturists (whose practices are minutely recorded by Columella), made all possible use of fallows, but failed to understand the necessity of manufacturing farm-yard manure, by feeding live stock on food rich in fertilising agents, and thus they reduced lands from which they drew their supplies of corn, to barrenness. The late Mr. Thomas Gisborne, a very competent authority both as a Latinist and agriculturist, states that the Roman agricultural course was, with partial exceptions, a crop of grain and fallow. Every year one-half of the arable land was in grain, one-half in fallow; arable land was manured only once in six years, and in that period bore three grain crops and one green crop—rather hard usage. It is true that Roman writers on agriculture give very minute directions for husbanding manure and manure-making articles, but a large portion of what was collected was devoted to vines, olives, and other fruit. The results were, that in the course of half a century the returns of corn decreased from fifteen for one in the time of Varro, to four for one in the time of Columella, and every later writer complains of the diminishing produce, and thus while the price of corn rose from three shillings and sixpence to ten shillings in the time of Cato, and sixty shillings the quarter in the time of Pliny, and while the cost of labour did not increase, the selling price and rent of land steadily declined. In England—in spite of the ominous prophecies of a distinguished and angry foreign chemist, who, great in general principles, has always failed miserably when descending to give practical advice—the reverse of all this has taken place in this country. The price and rent of land and labour have risen from generation to generation during the last hundred years, and the amount of produce per acre has been very materially increased on light and naturally barren soils by the use of farm and artificial manures, and on stiff clay by the use of thorough draining and deep cultivation.

Modern and Roman agriculture, when compared, present this remarkable contrast, "The Roman agricultural authors never look forward, but backward." They do not hope to increase crops, they only struggle to prevent them from falling off. The Englishman fully maintains, and in half a century has largely increased, his per acre produce.

In the modern farming of the highest order on our light lands—that order that raises the greatest possible amount of corn and meat from a given space—the land is constantly treated, not as a mine of wealth, to be continually worked by the spade or the plough, according to the dream of poets, but as a mere sponge, with which fertility is annually infiltered in the shape of manures, in order to be extracted in the shape of crops. As long as the average supply of food in England was equal to the average demand, farmers were content to farm by the rule of thumb—that is, by making use of the experience of their forefathers and their neighbours; but when the demand exceeded the supply, when they were invited to buy manures as well as seeds, they were compelled to consult the chemist, and learn the reason why of many operations they had long blindly and often successfully followed. At the same time, it must be admitted that according to the experience of most exact observers there must be some material difference between the effect of cultivation under a British and an Italian climate. We have plenty of light sandy soils, like important districts in Norfolk, Bedfordshire, Cambridgeshire, and Lincolnshire, which, without sheep, root culture, oil-cake, and artificial manure, would rapidly revert to the condition of the barren wastes from which they were reclaimed by liberal landlords and enterprising tenants, but we can find no instances in which a fair loamy soil of average fertility, cleverly cultivated, has ever been actually exhausted.

Mr. T. B. Lawes, who has expended upwards of twenty thousand pounds in agricultural experiments on his estate of Rothamstead, which have been carefully recorded in the Journal of the Royal Agricultural Society, grew wheat for twenty years on one acre of fair loamy soil; the result was sixteen bushels the first year, seventeen and a quarter bushels the last year, and an average of sixteen and a quarter bushels during the twenty years.

Thirty years ago—perhaps if we were to write twenty-five we should be nearer the mark—the farmer relied for keeping up the fertility of his farm almost entirely on sheep feeding and his farm-yard manure; he did not always take great care of that. If he lived, say in the midland counties, he heard, perhaps, that the Cheshire dairymen were using bones, or if in the west of England, man lime, but he had no means of learning whether either would suit his midland fields. It was the gradual increasing use of artificial, or rather portable, manures, that first introduced the farmer to the chemist. The acquaintance, which seemed very unpromising at first, has ripened into an intimate and mutually profitable connexion. The use of rape cake, bone-dust, and other than farm-yard or such accidental manure as seaweed or sprats, grew up by imperceptible degrees long before farmers obtained any other guide than experience of the special value of each kind of fertiliser. Thus in the west of England, from immemorial times, lime was used with great effect, especially in reclaiming waste land, for lime has a double value, first in assisting to burn up and decay exuberant half-dead vegetable matter of peaty and other soils, and next as supplying itself to soils where lime—an important constituent—was absolutely wanting.

We have no authentic record of how bones first came to be tried as a manure. There is a vague story that the first experiment was accidentally made of an accumulation of horse-bones near a kennel of Yorkshire fox-hounds. At any rate, in the time of Arthur Young, the Cheshire farmers found out that broken and crushed bones had a great effect in restoring the fertility of pastures exhausted by centuries of feeding for dairy purposes. We know now that bone-dust restores to pastures the very constituents—phosphate of lime—that are removed by milk, butter, and cheese; but the practice was pursued long before the chemical reason was discovered. From dairy pastures crushed and ground bones found their way to the turnip-fields, which were coming into use on every good farm a hundred years ago. The bones seemed to complete a circle of treatment that came into use about the same time. Turnips fed sheep, which, before root cultivation was introduced, could only be fed in winter on hay, a scarce, expensive food. The sheep's manure fertilised the soil while feeding, and prepared it for the corn crop in the following year. As this style of sheep cultivation was carried out on the heaths, wolds, and commons of Cambridge, Suffolk, Norfolk, and Lincolnshire, where farm-yard manure was not too plentiful, the bones came in, well distributed by a rude drill, to swell the turnips that were to feed the manure-distributing sheep. Very soon the bone-land farmers found the advantage, adding to the flesh and improving the manure, by giving peas, corn, and eventually oil-cake, to their flocks.

Sir Humphry Davy's ingenious speculations were the foundation of a school of agricultural chemistry, but to his suggestions only a select few farmers paid any attention. Amongst them was, however, Mr. Coke of Holkham, who sixty years ago drilled in turnip-seed, and used large quantities of purchased rape-cake as manure. But he and his tenants, with the Duke of Bedford, Lord Yarborough, Mr. Chaplin, and their tenants, stood almost alone for the next twenty years in this astounding extravagance and daring innovation.

The importance of the portable manure trade, and the profession of an agricultural chemist, date from 1835, when a Liverpool merchant imported a cargo of Peruvian guano, the most concentrated and powerful of portable manures.

Guano is the excrement of birds feeding on fish in almost rainless zones, deposited on desert islands in the course of thousands of years. In the same year nitrate of soda and other portable manure was also imported from South America. Chemists analysed guano, and found it richer in ammonia, the principal element in fertilising corn crops, than any other known substance. But, although farmers had not then reached their present state of confidence in chemists, they were rapidly converted, in spite of the patriotic speeches of haters of innovation, by the sight of great crops grown with the help of guano by the side of poor crops grown without.

In 1839, Professor Liebig had suggested the application of sulphuric acid to bones for the purpose of producing "super-phosphate of lime," the leading element in root crops. His suggestion was first applied on a commercial scale by a young Hertfordshire squire, whose favourite pursuit had been chemistry even when an undergraduate at Oxford. His agricultural connexions and position, as one of the council of the Royal Agricultural Society, brought into notice "Lawe's super-phosphate" as a portable manure which crops could absorb more quickly than even bone-dust. Super-phosphate of lime supplied a want long felt by the root-grower of a portable manure which could be applied when and where required to fertilise the plant at a critical time, and push forward its leaves beyond chance of injury from the "destructive fly." Stimulated by the steady demand, bones were imported from every country in the world, especially from the plains of South America, where at that time beasts were slaughtered for their hides and tallow only. Next, the geologist came to the assistance of the agricultural chemists, and fossils, coprolites, and appatite were found, when ground and submitted to the action of sulphuric acid, to yield a less soluble but still useful phosphate of lime.

The introduction of these two eminently portable manures, the one ammoniacal, the other phosphatic, producing evident and extraordinary effects, created a new class of manufacturers, who, by the manipulation of bones, flesh, blood, and other waste material containing nitrogen and the phosphates, with an admixture of guano, produced ammoniacal and phosphatic manures of more or less value for each description of crop, corn, roots, clover, beans or grass. Amongst these manufacturers were many able and honest men, who maintain their position to this day. But there were also a crowd of impostors, who palmed upon the credulous farmers, at an apparently low price, worthless stuff bearing in colour and smell a very close resemblance to really valuable manures. And it was in this way that farmers first began to consult the chemist, and place confidence in the inquiries of science. What farmers had to learn is very neatly explained in the following passage from Gibson's Hand Book of Agricultural Chemistry: "In applying manures, we not only put back into the soil the fertility that has been taken away in crops, but we add new material, and by altering its constitution add to its productiveness. It often happens that soils possessing most of the character of fertility are defective in one or two essential constituents; by adding these, the quality of the land is greatly improved. Few soils are equally fitted to grow every kind of crop. For instance, clay soils, which will produce five crops of corn with little or no manure, do not yield the best crops of turnips. Turnips will flourish where corn fails, while lime soils are particularly favourable to clover, pease, and other leguminous plants. A complete soil, on the contrary, will produce with almost equal luxuriance every kind of crop."

In theory, any soil may be rendered perfect and complete; in practice, the improvement must be limited by the cost, especially of carriage. It would require on some soils forty shillings of special manure to grow twenty shillings of produce.

In the transition stage of British agriculture, say between 1844 and 1855, there was an axiom, which, from the mouth of a squire of the old school, addressing, say, a party of Northamptonshire farmers, never failed to bring down repeated rounds of applause: "Nothing like muck." Of course this axiom was accompanied by contemptuous reference to guano and other foreign rubbish. It was reserved for the chemists to show the true value, the true mode of manufacturing, preserving, and applying the invaluable home-made manure. If the Royal Agricultural Society had done nothing else than give the world the benefit of the experiments of their chemists, Professors Way and Voelcker, the vast cost of its maintenance would have been amply repaid.

Dr. Voelcker states broadly that no amount of artificial manure, however skilfully mixed and prepared, can ever imitate or supersede the use of farm-yard dung. But artificial manures will often supply, within the short time required for starting and maturing a crop, a want which no quantity of farm-yard manure could supply in the time. For example, the essential of a good corn crop is ammonia or nitrogen, of a root crop phosphate of lime; both these constituents are found in well-rotted farm-yard manure. But to get one pound of ammonia we must take one hundred and thirty-seven pounds, and to get a pound of phosphate of lime one hundred pounds of well-made dung, while we can get both in about twenty pounds of artificial manure. What are called exhaustive crops are those which draw the greater part of their nutriment from the surface—for instance, flax; but the chemist has taught the farmer that after a crop of flax an excellent crop of wheat may be grown by a top dressing of guano, which supports and stimulates the young wheat crop until it has had time to send down its rootlets, and drink up the ample stores of fertility available in well-cultivated soil.

The advantages, then, that have been derived from the discovery and invention of what, for

convenience, we will call artificial manures, are threefold. First, portability: they can be easily applied to a crop, either by the drill, or broadcast, as a top dressing; and they can be economically carried to districts where little farmyard manure is made, and where, from the steep character of the ground, carting manure is too costly. Next, they supply a stimulant in an active concentrated form, which secures, at important periods and to the very place wanted, rapid vegetation; and, lastly, they induce farmers to study and adapt the cultivation of their farms to the character of the soil.

It was soon found that artificial manures were wasted when applied on undrained, ill-cultivated soils. It did not suit farmers to have a manure for which they had paid eight or ten pounds a ton in hard cash washed away from the undrained surface by the first heavy shower; thus, the sale of artificial manures stimulated the extension of thorough drainage. It was also found that a thorough trituration of the soil was essential to produce the utmost benefit from artificial manures. Clean cultivation was an obvious part of farm economy, because it would not pay to grow weeds with manure that cost money. Artificial manure, by introducing the farmer to the chemist, had another effect, it taught him to study and husband the manures he manufactured at home; that is, to consider the effect on the manure they produced of the food he gave his live stock.

By degrees the trade in imported and artificial manures has become enormous. Professor Way has recently estimated the annual consumption of guano at from one hundred and fifty thousand to two hundred and fifty thousand tons, and of phosphate of lime, including bones, at from one hundred and fifty thousand to two hundred thousand tons; guano being worth thirteen pounds, and super-phosphate seven pounds, per ton.

But this vast consumption of portable manures has in no degree checked the use of the home-grown article, farm-yard manure; on the contrary, it will be found that those farmers who feed their live stock most liberally on oil-cake, pulse, and other purchased food, and who most carefully prepare and store farm-yard dung, are also those who most liberally invest in portable manures, whether ammoniacal or phosphatic. The accepted directions for growing a first-rate crop of mangel-wurzel, are the careful ploughing or smashing up by steam-power of a stiff soil, the ploughing in of twenty loads per acre of good farm-yard manure, and the addition at sowing time of two hundred weight per acre of a portable root manure, principally composed of phosphate of lime, with a slight mixture of guano. Dr. Voelcker has proved that phosphate of lime, while so valuable an assistant in growing roots, produces little or no effect on stiff clay soils without deep and complete cultivation; and he has pointed out that there are in this country a class of clay soils which will grow excellent and repeated crops of grain, if well deeply cultivated, with little or no manure—such is the aptitude of these soils to assimilate the vast stores of ammonia floating in the atmosphere. It is on such soils that steam cultivation plays an important part.

On the general run of clay soils, the use of solid long straw farm manure is essential in a mechanical point of view; it helps to make the soil loose, and reduce it, in conjunction with the plough or the steam cultivator, to the fine tilth, the porous disintegrated state, which is the great object of the husbandman in northern and weeping climates.

About the same time that purchased portable ammoniacal and phosphatic manures were introduced to the farmers of this country, an exceedingly ingenious gentleman, the late Mr. Smith of Deanston, who had in turn been a farmer and a manufacturer, and experienced equal ill success and displayed equally extraordinary inventive ingenuity in both pursuits, thought he had discovered a system which, had it realised all his expectations, would have been something very like agricultural perpetual motion.

He found at Edinburgh a truly "Foul Burn," which had for nearly two hundred years conveyed the sewage of part of the city over certain fields on the sea-shore. At the time he made his examination, this liquid sewage, flowing from the city on a hill, had been for upwards of twenty years carefully conveyed on the water-meadow system of irrigation over several hundred acres with an admirable result.

He found sea-sand, perfectly worthless in its original state, converted, by sewage irrigation, into meadows, bearing every year a series of most luxuriant crops of natural and artificial grass, and yielding rents of from twenty to thirty pounds an acre.

The sight fired his sanguine imagination. He was at that time an officer of the new board for improving the sanitary condition of the towns by drainage and water supply, and he believed that he saw in agricultural use and sale of the sewage of towns, an unfailing source of revenue, from which the whole cost of sewers, and water supply, parks, fountains, and other public embellishments, might be defrayed. But as all towns were not so fortunately placed as Edinburgh, on a hill, and as in expectation of a universal demand—for other crops beside grass would require irrigation—with characteristic ingenuity he devised a system for pumping by steam-power where gravitation could not be employed, and of distributing the liquid manure through a network of subterranean pipes, worked by a steam-engine, with hose and jet like a fire-engine. In the absence of exact chemical knowledge, he calculated that sewage was of about half the strength of guano, and that clay soil would yield to liquid sewage as bountifully as sand. We now know that one-twentieth would be nearer the mark.

Human excreta had been in use as manure

from the earliest ages. We might here say a great deal about China, had it anything to do with our subject. But it has not. The climate of China is as unlike that of England as the habits of the people are.

Until the general introduction of sewers and suppression of cesspits, and of house to house water supply and suppression of wells, the sewage of our great cities—and especially of London—was a regular article of exchange between the town and the country. The carts and waggons that brought in hay, straw, and garden vegetables, took back not only stable dung, as at present, but the contents of cesspits, and found in the latter a valuable manure, second only in power and utility to the best farm-yard dung.

The reports of Smith of Deanston, and his directors and coadjutors at the Board of Health, who were not practical agriculturists, and had all the enthusiasm of amateurs to whom a new branch of knowledge had been opened, created great excitement in the speculative world. The stores of neglected sewage were measured against guano, and rather the advantage was given to the sewage. Companies were formed for desiccating and deodorising the solid, and for distributing the liquid, and extraordinary expectations were entertained of the results.

The fact is, as chemists and practical experience have since taught us, there is no sort of likeness between sewage and guano, and no sort of possible competition as long as the latter exists. The value of guano consists in its concentrated strength and consequent portability. Theoretically, it contains seventeen times, practically, twenty times, as much ammonia as the very best specimen of farm-yard or human manure, and ammonia, as already observed, is the most powerful manurial ingredient in producing cereal, which are the most profitable crops.

But the amateurs who had the matter in hand, being without experience, and excusably dazzled by stories of Chinese and Italian cultivation, pursued a theory which, had it been pecuniarily sound, would have realised millions, and have formed half the farms of England into irrigated fields.

According to this theory, framed in forgetfulness of the rainy nature of our climate, liquid manure was superior to solid manure under all circumstances, and on all crops, and all soils, and town sewage was equal to the best liquid manure. But this last theory was based on another theory, viz. that the water of a town properly sewered and fully supplied, would not exceed twelve and a half gallons per head. On the soundness of this theory, or rather bundle of theories, which was authoritatively and officially propounded for several years in Board of Health Blue-books, much discussion arose in agricultural circles, to which it is not now necessary to refer, because we have enough examples on a large scale, and enough evidence from men in every respect competent to settle the paying part of the question. In several counties of England and Scotland farms were laid out at vast expense for the express purpose of converting all the farm dung into liquid; the fields were covered with a network of iron pipes, through which the liquid was forced by a steam-engine, and distributed over the land in artificial rain by hose and jet.

In Scotland, Mr. Telfer's farm of Cumming Park, and Mr. Kennedy's of Myremill, were for several years quoted as examples of the splendid success of the liquid manure theory. Certain it was that they both grew such crops of Italian rye-grass (five and six cuttings more than eight tons to the acre in one season) as had never been heard of before. Mr. Telfer's was, perhaps, the most beautiful model of dairy farming in Europe. The cow-house was as clean as a parlour, cleaner than most cottages; not a particle of straw was used; the cows reposed on cocoa-nut matting. The butter produced commanded the very highest price in the London market. Myremill farm, on a larger scale, was cultivated with equal enterprise. But in England and in Scotland, whether the cultivators were farmers, or merchants, or retired tradesmen, the general results were invariably the same. No instances can be quoted of pecuniary success—the sole test of success in agriculture—where it was necessary to drive the liquid manure through hose-jet by steam-power, or of the successful application of liquid manure to clay soils. In several instances the experiments ended in total and disastrous ruin—the most enterprising being the most unfortunate.

When the Western Bank of Scotland suspended, the model farms of Cumming Park and Myremill disappeared from the agricultural world, in which for so many years they had held so conspicuous a position. Nothing has been more distinctly settled than that liquid manure cannot bear the expense of hose-jet and steam-engine on a really paying farm. It was also found that the only crops that would bear and repay *the continuous* application of liquid manure were natural and Italian rye-grass, grown on self-drained soils. There are seasons of drought when a supply of water, or better still of liquid manure, would be of the greatest value in damping the earth, before or after drilling roots, in reviving a transplanted crop of cabbages or mangel-wurzel, or refreshing corn in an early stage of growth, or saving a hay crop; but the fact became, by every year's experience, more prominent, that grass, which grows for more months in the year than any other crop, and which has, when cut, an almost unlimited capacity for absorbing moisture, and growing again, is the most profitable crop for the application of a constant supply of liquid manure. On the other hand, while under-piped steam-worked liquid manure farms failed to pay, wherever liquid manure was applied to grass in the cheapest manner, by gravitation through open channels or porous soils, the results were satisfactory, and often very profitable. But it is necessary to keep in mind that modern

town sewage is a very much more diluted fluid than the liquid manure of a well-managed farm, to which guano and super-phosphate are not unfrequently added.

All towns completely sewered have very far exceeded the estimate of twelve and a half gallons of water per head. There are no towns supplied with water closets in which the sewers do not receive, from one source or another, upwards of thirty gallons of water per head per day. In London the supply is over forty gallons per head. Now every gallon of water, beyond four or five, diminishes the manurial value of the sewage.

But here, again, we need not theorise. In eight towns, sewage has been applied to agricultural purposes. An examination of the experience of these towns brings out plainly certain very important facts. The eight towns are: Alnwick, Croydon, Carlisle, Edinburgh, Malvern, Tavistock, Rugby, and Watford.

The mode of application and the result of the application in these towns is given in a table (which it would take up too much space to quote), to be found in the Appendix of a very comprehensive pamphlet on the Value of London Sewage.* From this table we find that in all the instances in which the distributing arrangements are actually at work, the application is exclusively to either natural grass or to artificial, such as Italian rye-grass. That in the instances which are most conspicuously successful in a pecuniary point of view, viz. Edinburgh, Carlisle, Croydon, Malvern, and Tavistock, the application is by gravitation on the water-meadow system in opposition to subterranean tubes, hose, and jet. That at Rugby, which was underpiped and is worked by a steam-engine, the hose and jet has been abandoned in favour of open channels, and at Watford the sewage, which was expected to be available for even the two hundred acres underpiped, is applied to growing rye-grass on seven or eight acres. At Rugby, the sewage which Mr. Campbell rented for two hundred acres is applied to about twelve acres of grass. In all the examples the success is the greatest where the land is porous, self-drained, and so situated that the sewage can flow over the surface from field to field until all the fertilising matter is absorbed. In Edinburgh, pure seasand, irrigated with sewage, has for more than forty years yielded enormous quantities of produce in grass, worth every year twenty-five to thirty-five pounds an acre, and at Croydon, although it is more difficult to arrive at the true profit, because the experiment is recent—the proceeds being divided between the landlord, the Croydon Board of Health, which is the first tenant, and Mr. Marriage, the farmer, who rents it from the Board of Health—there is no doubt the value of the produce is about the same as at Edinburgh.

* The Agricultural Value of the Sewage of London. Stanford, Charing-cross.

At Alnwick, which has been sewered and supplied with water on the most modern system by Mr. Robert Rawlinson, C.E., the sewage can only be raised to the requisite height by a steam-engine, and then the climate being very rainy, the farmers did not find the increase in grass crops equal to the expense of the pumping apparatus, and after two years declined to pay for the pumping.

It is with this experience before them that the Metropolitan Board of Works have been called on to select a plan for turning the sewage of London to use, and saving the Thames, at Barking, from pollution. For at Barking, according to the original main drainage scheme, the sewage of nearly two million inhabitants of the north side of the Thames was to be poured into the river at low water.

The sewage of London cannot be applied to land with the same facility as the outpourings of a village or the contents of a farm tank. First, the contents are enormous, and the tide constant, running day and night. If the Thames is to be kept clear every day, two hundred and seventy-seven thousand tons, or about ten million of cubic feet, which would fill a lake of seventy-five acres three feet deep, must be laid upon land of a character which will absorb it without creating a nuisance—an awful foul and murky stream, scarcely to be realised without being seen, has to be disposed of. Next, the manurial virtues of this stream, in which the excreta of each person are diluted in more than forty gallons of water, are very feeble. If the water supply of London could have been restrained within Mr. Edwin Chadwick's estimate of twelve and a half gallons per head, then the demand amongst farmers would have been much more active. Such a liquid sold at twopence per ton would have secured to each purchaser, for something like fourpence-halfpenny per acre, the annual excreta of one inhabitant. But all men of practical and scientific experience are agreed that, to make the most of the sewage of London, thousands of tons must be poured on the poorest and sandiest soil that can be found, and then the marvels of the Edinburgh Craigentemy meadows may be renewed, and land not worth five shillings an acre made worth five or six hundred pounds.

On this point agriculturists, agricultural chemists, and engineers of special experience, are entirely agreed. The Metropolitan Board, before deciding on the merits of the various schemes submitted to them for the utilisation of the sewage of London, had the advantage of being able to read the evidence taken in two successive years before two committees of the House of Commons. The unanimity amongst those whom practical experience and scientific research rendered peculiarly competent witnesses, was remarkable. No man has paid more attention to the question of utilising town sewage than Mr. Robert Rawlinson, one of the engineer inspectors of the first Board of Health. He has had great experience, and his experience

has confirmed him in the necessity of applying sewage to land, but modified his original views of its value. Mr. Rawlinson is part proprietor of a small estate at Worthing, purchased for the express purpose of irrigation by sewage on the same plan as at Croydon—viz. open channels and surface application. He says: "At Worthing they act with wisdom; they charge nothing for the sewage. If they had charged anything, there would have been no experiment. They not only give the sewage, but lift it on the land." We are going to put the sewage of two thousand people on forty-two acres. "I do not approve of the method of passing sewage through small pipes and applying it by hose and jet. You cannot make sewage pay in that way. If I had to do with the sewage of London, I should try to get it on an area of about thirty thousand acres. To distribute it over four times that area would cost sixteen times as much, both for distribution and management."

Sir Joseph Paxton is a specimen of the most intelligent class of agriculturists and cultivators. His practical evidence agrees entirely with that of the agricultural chemists. He says: "I consider sewage a great rough sort of business; you cannot put it into nice forms and ways. I should like very much to apply small dressings to land by hose and jet, so as to just wet the roots of plants, if you can show me how to do it, but I have not the slightest notion that you will ever get the system applied to the extent that would be necessary for disposing of the sewage of London. According to my calculations, the excreta of two hundred and fifty persons can be placed on an acre of ground, so it would take about thirty thousand acres of land to extract all the absolute growth out of the sewage of the three million inhabitants of the metropolis. According to a rough guess, you have something like forty gallons of water to each inhabitant per day. Now, forty gallons would not be very strongly impregnated with matter which would largely develop plants. On the other hand, water alone, if you could get it on the land, would, at certain times when wanted, be worth one penny to twopence a ton. Sandy soil is the best, a soil that will allow a very large quantity to pass through it without artificial drainage. On sand in proper weather you can hardly apply too much sewage to vegetation; in clay lands it is otherwise, because it cannot pass off."

Mr. Christie Miller, the fortunate proprietor of the Craigentemy meadows, with nearly forty years' experience, gives evidence which in every particular squares with Sir Joseph Paxton's opinions. He says, that while the results of the application of sewage to grass recently mowed in hot weather are perfectly marvellous, producing a visible growth in forty-eight hours, he is satisfied that it is not likely to be beneficial to wheat or turnips, under ordinary circumstances. "Water streamed upon arable land makes furrows and channels, and washes the roots of wheat and turnips bare."

The agricultural chemists—for instance, Professors Way and Voelcker—agree entirely with the agriculturists. They recommend as most profitable the application of large quantities of liquid sewage to sandy or self-drained soils, and to grass crops, because they can take a profit by manure almost all the year round. Professor Way says: "I can make sand by the application of sewage water richer in clay every year, but I could never get a clay soil open enough to receive sewage." Both these eminent chemists treat with ridicule the enormous value put upon the sewage of London in parochial and City of London corporation discussions, and by the celebrated Professor Liebig. *They* agree that, theoretically, if something that is quite impossible to do could be done—that is, if the manurial ingredients contained in the sewage of London could be dried and exhausted—the value would be about twopence per ton, but "when you have the ingredients analysed, you have by no means arrived at the value of the sewage practically for farming purposes." Thus, although the solid matter in a ton of liquid manure is worth, theoretically, twopence a ton, the liquid manure is not worth nearly so much, because the solid matter is mixed up with a large quantity of water, which, during the greater part of the year, in our climate is surplusage, if not positively injurious to the most profitable crops of a farm.

The value of sewage for dairy purposes has been shown in a very striking manner by the experiments of Mr. J. B. Lawes, as one of the Royal Commission on the subject. He found that while an acre of grass unmanured kept a cow twenty weeks, producing milk worth eleven pounds, fifteen hundred tons of sewage made an acre worth eighteen pounds fourteen shillings, three thousand tons, twenty-six pounds eighteen shillings, and four thousand tons, thirty-one pounds eleven shillings. Yet there are people stupid enough to believe that Mr. Lawes, who has spent in the last twenty years more than twenty thousand pounds in agricultural experiments, is opposed to the utilisation of sewage. With the preceding evidence before them, it is not extraordinary that the Metropolitan Board rejected the scheme of a person who, like Rip van Winkle, seems to have slept away all the period of experience between the time when Smith of Deanston dreamed his dreams of millions of revenue from town sewage, and when Croydon turned its liquid refuse to agricultural use, and Mr. Robert Rawlinson matured his plans for irrigating meadows with the contents of the sewers of Worthing, rejected a scheme for pumping back the sewage collected at Barking, to Hampstead or Harrow and Shooter's Hills, and thence retailing it at twopence a ton over half a million acres, to be netted with iron pipes and irrigated by hose and jet, a class of clay-land farmers who have always, and wisely, rejected the use of liquid manure

—a scheme which was to cost six millions to carry out, and three hundred thousand a year to work.

The Board have approved a plan prepared by an eminent engineer, Mr. George Hemans, for reclaiming a large part—about ten thousand acres—of sea-sand in Essex, and creating on it, by the constant irrigation of London sewage, the fertility presented by the Edinburgh meadows. This plan will secure to the inhabitants of London the steady absorption of the whole sewage of the north side of the Thames. It will turn this worthless tract of sea-sand into meadows worth five or six hundred pounds per acre, while the huge brick culverts, forty miles in length, which will conduct the sewage to flow by gravitation over the sands, will be so arranged that the farmers on either side, occupying something like eighty thousand acres, will be able to obtain either a constant supply for a complete sewage farm, or occasional irrigation in times of drought; an inestimable boon which will enable them to save in dry seasons roots, cabbages, lettuces, grass, or other thirsty crops, by a timely application of a gigantic watering-pot, without incurring the expense of the elaborate machinery required by subterranean pipes and hose and jet irrigation.

Thus will London get rid of her constant supply of sewage, the Thames be saved from pollution, and the ratepayers become sleeping partners without risk in a most promising scheme of reclamation and irrigation.

WANTED TO BORROW, ONE HUNDRED POUNDS.

Has it ever been your fate, reader, to be in want of money? I don't ask whether you have —for all men have, and women, too, for that matter—felt a temporary pressure caused by an empty purse, or a much too small balance with your banker. But have you ever known what it is to feel that, unless you can by a certain —and not far off—day find a sum of money which to your means bears about the same proportion that half a million sterling would to a City magnate of the second class, you would come to grievous trouble? To illustrate what I mean, I will tell my own tale of what recently befel me in matters monetary.

I had backed a bill of one hundred pounds for a friend. Of course the said friend promised most faithfully that I should never hear of the document again; it was "a mere matter of form." Equally as a matter of course, when the bill fell due my friend could not pay it, and, to avoid proceedings being taken against him, "kept out of the way;" in other words, he betook himself to the Continent. Unfortunately for me, my occupations prevented me leaving London, and so within twenty-four hours after the bill was dishonoured, I received a lawyer's letter requesting me to pay the amount *at once*—the word used was "forthwith"—with interest, and further to remit the writer six-and-eightpence for the letter he had there and then written to me. I was further informed, that if I failed to comply with any one of these demands, "immediate steps would be taken to compel payment, without further notice."

At the time I received this pleasant epistle, I had at my bankers the modest sum of forty-four pounds seven shillings and sixpence, and in a few days more my month's salary of twenty-five pounds would be payable. On the other hand, it was close upon Christmas. The butcher, baker, grocer, children's school bills, rent, rates, and taxes—to say nothing of my own tailor, my wife's milliner, and the bill for "the girls' clothes"—had all to be paid. If I managed to make tongue and buckle meet for the past quarter it would be as much as I could do, and now I had the additional burden of this one hundred pounds thrown upon me. I sat for some time contemplating the letter I had received, wondering by what process a man could be "compelled" to pay money when he had not the wherewith to pay it, and thinking whether it would not be a good thing to learn the secret, in order that I might sometimes apply it to myself.

At last I resolved to be up and doing. I went to call upon the solicitor that had written me the letter, and was by him referred to the holder of the bill. I called upon the latter, and was referred back to the solicitor. To this gentleman I exposed the exact state of my finances, and showed him how that, unless I was given time, it would be utterly impossible for me to meet the bill. When convinced of this, the attorney promised to see his client, and to let me know what could be done. A day or two after, I received a letter from him, stating that if I could get another householder besides myself to join me in a fresh bill for one hundred pounds at two months, pay ten pounds down, and insure my life for one hundred and fifty pounds, the holder of the bill would not press me for immediate payment.

These terms I declined, but offered to pay ten pounds down, in order that I might have time to look about me, and see whether I could not raise the money. This was agreed to, but I, unfortunately, did not ask for the agreement to be in writing. I paid the ten pounds, on a verbal understanding that proceedings were to be stayed for the present, and the next day was served with a writ.

Now a writ upon a bill of exchange is a thing not to be trifled with. You cannot, to use a legal term, "enter an appearance" when sued upon such a document. As the solicitor to whom I applied for advice informed me, once a writ is served upon any one for a bill of exchange, he must either pay the money within twelve days from the time of such service, make up his mind to have an execution put in his house, or, should he have no property that can be seized, be arrested. I had, therefore, exactly

twelve days left me in which to find one hundred pounds, or else make up my mind to be lodged in Whitecross-street, unless I preferred an execution being put in my house, and perhaps three hundred pounds' worth of furniture being taken to pay a debt of one hundred pounds.

Here, then, commenced my troubles—not that I thought at first there would be any difficulty in the matter. For did I not, in common with all the hundreds of thousands who read the Times, Post, Daily Telegraph, and other papers, see announced every morning, in some half-dozen advertisements, that money can be had almost for the asking? I took the first of these advertisements that came to hand, and learnt "THAT MERCHANTS, TRADESMEN, AND GENTLEMEN, IN POSITIVE EMPLOYMENT, CAN HAVE CASH ADVANCED UPON THEIR PROMISSORY NOTE ALONE, WITHOUT SURETIES, BILLS OF SALE, OR SECURITY OF ANY DESCRIPTION. ALL INQUIRIES AND REFERENCES ENTIRELY DISPENSED WITH, AND THE GREATEST CONFIDENCE OBSERVED. NO CHARGE WHATEVER UNTIL THE MONEY BE ADVANCED. APPLY PERSONALLY, &c. &c."

Here, thought I, is the very thing for me. I believe I am "a gentleman," I know that I am "in positive employment," and so it will follow, as a matter of course, that I can have "cash advanced upon my promissory note alone." But I was doomed to be soon undeceived.

I proceeded to the place named, which was at the office of a Loan Society in the City. Upon entering, I was shown in to the secretary, who in his manner was politeness itself, and at once proceeded to business.

"What sum did I require?" "Was I a householder?" "Was my furniture my own?" "Was it paid for?" "What did I require the money for?" "Had I any other debts, and of what amount?" "What was the amount of my income?" "From what source was it paid?" "Had I any property independent of my salary?" All these questions were asked me, and my replies written down there and then. Having done this, the polite secretary informed me that a "gentleman from their office would wait upon me next morning at my house, and that if his report was favourable, I could have a cheque for the money on the following day, if I would call again about noon." Our interview was all over in ten minutes or less, and I was politely bowed out of the office.

Early on the following morning, at my own house, a gentleman was announced as wishing to see me. He introduced himself as Mr. So-and-so, sent by the Secretary of the Loan Society. Like the chief of his office, no one could be more gentlemanlike in his manners, or more prompt in his way of doing business, than was this young man. As regards the furniture, he merely glanced at what he saw in the drawing-room, but did not ask to be shown any other apartment in the house. He requested me to show him my agreement with my landlord, and my receipts for rent, taxes, and rates, of all of which he made notes, and took his leave, begging me to call at the office the next day about noon, when I believed that I would "find no difficulty" in obtaining the loan I required. He was not more than a quarter of an hour in the house altogether.

Accordingly at twelve o'clock on the following day I presented myself at the Loan Office, and was at once shown in to the very civil secretary, who on this occasion was more polite than ever, and, according to his excellent habit, at once proceeded to business.

"We have no objection, Mr. Jones," said he, "to advance you the money you require, but our terms are high, for we do a very risky business. Moreover, in addition to your own note of hand, we shall require a Bill of Sale over your furniture. If you agree to our terms, all the necessary papers can be signed and witnessed here at once, and you can have a cheque for the money in ten minutes' time."

To a man with a writ hanging over him, the prospect of a cheque "in ten minutes' time" was both pleasant and tempting, but being born north of the Tweed, I desired to look more closely into the business before I committed myself further. Moreover, I objected to the Bill of Sale upon my furniture for two reasons. In the first place, although partially, the furniture was not wholly paid for. In the next place, I knew that all Bills of Sale must be registered, and that most registrations, being published weekly in certain mercantile journals, tend very greatly to damage the character of those on whose property, or goods, the Bills of Sale are made. To this the very civil secretary replied that as, although not entirely paid for, the furniture was to all intents and purposes my own, there would be nothing dishonest or dishonourable in giving a Bill of Sale upon it. I could not quite see the logic of this argument, but did not make any reply for the present. As for the registration of the Bill of Sale, he assured me that nothing of the kind was intended. The Bill of Sale would be kept by the Loan Society, and only registered in the event of my failing to make the payments I had entered into at the required time. Being so far satisfied—although by no means altogether so—I then looked closer into the other terms propounded to me for the proposed loan.

I was to give four notes of hand of twenty-five pounds each, payable at one, two, three, and four months respectively, in addition to the Bill of Sale. Should I fail in any one of my payments, the Loan Society would have full power to sweep down upon my house, and take everything out of it. For these four notes of hand I was to receive a cheque for eighty-four pounds—sixteen pounds being deducted for interest and expenses. I was thus to pay at the rate of forty-eight per cent per annum for the loan of one hundred pounds; but, as after one month I was to pay back twenty-five pounds, I should then be paying interest at the rate of forty-eight pounds for seventy-five; and as after two months—supposing my instalments to be duly

paid—I would have reduced my debt to fifty pounds, I should then be paying at the rate of forty-eight pounds per annum for fifty pounds—or within a fraction of a hundred per cent—while for the last month I should be paying interest at the rate of forty-eight pounds per annum for the loan of twenty-five pounds, or close upon two hundred per cent. With terms like these no wonder that the Loan Society could afford to do "risky business;" which, in my own case, having the further security of my furniture, I could not see was so very dangerous.

To conclude a loan on these terms appeared to me little short of madness, to say nothing of the moral dishonesty of giving a Bill of Sale upon what I had not paid for. I must, however, do the secretary the justice to say that he did not press me to close with his terms. He was polite to the last, even when he could plainly see that I did not intend going through with the business. We had a long conversation upon loans and loan societies. He told me that the losses of the office were rather over than under one hundred pounds a week, but, notwithstanding this, the net profits upon their paid-up capital was more than seventy-five per cent per annum. The names of the directors as well as of the shareholders, he said, were known only to themselves, but even the latter did not exceed a dozen in number. The loans they made generally exceeded two thousand pounds a week. They never asked for references, and kept everything perfectly private respecting loans made to individuals. They never discounted bills, nor would they lend upon the personal security of other parties. Their business was, he repeated, very risky, but it was certainly profitable. We parted excellent friends, I merely saying that I would think over the proposition, and give him an answer in a day or two. Of course I never intended to move further in the affair, and he plainly saw that such was my determination. But I had nothing to complain of. If the terms asked for the loan were high, the lenders had a perfect right to ask their own conditions. They had not asked me for a shilling in the way of "inquiry fees," or office expenses, and—had I chosen to give the interest they asked—I believe that the money would have been promptly paid.

Failing to obtain the money I wanted in the East, I tried the West-end of London. This time I applied to a gentleman who advertised as being willing to "ADVANCE MONEY IN TOWN OR COUNTRY AT FIVE PER CENT, UPON PERSONAL OR OTHER SECURITY, FROM ONE HUNDRED TO ONE THOUSAND POUNDS." His office was in a street off the Strand, and, on calling there, I was requested to wait a short time, as Mr. Watson was particularly engaged. Beggars must not be choosers, nor must borrowers be fastidious. I therefore said I should be happy to wait in the outer office, and was offered the advertisement sheet of the Times, with which to amuse myself until the great man was ready to see me.

I had had plenty of time to read all the births, marriages, and deaths, announced in the leading journal—to speculate upon all the mysterious advertisements in the second column, in which E. A. M. is entreated to write to his afflicted wife, and J. S. G. is requested to return home to his disconsolate family—and to wonder who were the extra-honest persons that sent halves of five-pound notes to Mr. Gladstone in payment of over-due income tax—long before it was intimated to me that Mr. Watson could see me. At last I was shown into his sanctum, and was received by an elderly gentleman, with a remarkably unpleasant expression of countenance, and whose large white whiskers formed a curious contrast to his fawn-coloured wig. After a few preliminary remarks, I mentioned my proposed loan, upon which the old gentleman seemed quite surprised, as if it could ever enter into the mind of any man to visit him for the purpose of getting money. He hummed and hawed, said money was very difficult indeed to be had just at present, and ended by asking me what amount I required, and what security I proposed to offer.

I replied that, seeing by his advertisement he advanced money at five per cent, I had called upon him. That I wanted a hundred pounds, repayable by monthly instalments of five pounds. That I would deposit in his hands shares in a certain company representing two hundred pounds when taken at par, but which were likely soon to be at a premium, and that I would, moreover, give him the security of a friend, who guaranteed that, in the event of any instalment not being paid, he would pay the amount.

Mr. Watson made a note of all I said, and informed me that, before he could take any steps whatever in the matter, I must pay an inquiry fee of two guineas, which would not be returned in the event of my loan not being carried out. This I agreed to, and at once paid the money, being told to call again in three days, when a reply would be given me.

I did call again in three days, and was told that Mr. Watson was out, and would not be back for some hours. I called twenty-four hours later, and found he was most particularly engaged. I wrote a somewhat indignant letter, and received no reply. I wrote a second time, and met with the same result. I called once more, and after waiting a considerable time—on this occasion the amusement provided for me was the advertisement sheet of the Daily Telegraph—was shown into the money-lender's private office only to be received by him standing, and to be told that my proposition for a loan could not be entertained. I believe that man, like many others of his fraternity in London, never lent money, nor indeed had any to lend, but that he lived upon the inquiry fees which were paid by persons who, like myself, attempted to borrow money from him.

My time was running short. Between the loan office and Mr. Watson seven days had been

lost, and in five days more—one of them being Sunday, on which nothing could be done—the writ would be run out, and I should be liable to be arrested without warning of any kind. In my despair I applied to a solicitor, who advised me to get the amount upon a three months' bill, which was to be backed by a friend of his for a consideration of ten pounds. To this I agreed, intending, during the three months which I should thus gain, to obtain money from another source. The bill was drawn by me, and accepted by a gentleman to whom I paid a bonus of ten pounds, and who, at the same rate of commission, would have accepted a bill of any amount I liked to name. This time, however, I took the precaution of bargaining that the ten pounds was only to be paid in the event of the bill being discounted, for my friend the solicitor only found me an acceptor for my bill—he did not undertake to provide me with a party who would discount it. However, he gave me a letter of introduction to a bill-discounter in the City, who, although high in his terms, was safe to "do" the bill for me.

"High in his terms!" I should rather think he was. To find this gentleman's office was as difficult as to obtain reliable information out of Bradshaw. It took me the best part of an hour to hunt behind the Mansion House for the court in which, up four pairs of stairs, with one small boy for a clerk, and a few broken chairs as furniture, he transacted his business. To do this money-lender justice, he was very prompt in his dealings. He at once said he would take the bill—which was drawn at three months, for one hundred and thirty pounds, in order to cover contingencies. For this bill he offered me a cheque for eighty pounds, thus charging me interest at the rate of something like one hundred and eighty per cent per annum.

To accept terms like these would have been utter madness; therefore, although almost despairing as to what to do next, I betook myself away, taking with me the bill of exchange, which was now of no use.

An advertisement of "The Mutual, General, Universal, Benevolent, and Prudent Life and Loan Insurance Society," attracted my attention about this time. I had but few days left in which to obtain the money I required, but, by paying another ten-pound note to the holder of the bill upon which I was being sued, I obtained an undertaking that judgment would not be signed against me, nor would any further proceedings be taken for another week, thus paying at the rate of more than a pound a day to stave off annoyance for the present. Having managed this, I called at the "Mutual, General, Universal, Benevolent, and Prudent Life and Loan Insurance Office," and asked upon what terms I could borrow a hundred pounds. I was informed that I should in the first place have to insure my life for three hundred pounds; that I must give a bond signed by three householders of solvent means for the due repayment of the loan; and that, should any one of the instalments which I engaged to pay not be paid at the time appointed, my sureties would be at once called upon to pay up the whole loan. In the mean time, I was given four printed forms, one of which I was to fill up, and one of each of which had to be filled up by the gentlemen who consented to be my sureties. But I was told that, before any steps whatever could be taken in the matter, I must pay down the sum of two guineas as an inquiry fee, which amount, the clerk told me, "would on no account be returned should the loan not be carried through." I paid the money—not without misgivings as to my ever deriving any benefit from so doing—and betook myself to getting three friends who would act as my sureties in the bond I had to give.

After four or five days of incessant toil, worry, and trouble, I managed to obtain the consent of three friends to join me in the bond. One of these was a clerk in a government office; he was a householder, and had an income of about three hundred pounds per annum. The second—also a housekeeper—was managing man in a large merchant's office in the City; his salary was two hundred pounds a year, besides which, he had a little private property of his own. The third was a retired Indian civilian, whose pension and income together amounted to upwards of two thousand pounds a year.

Believing myself now quite sure of obtaining the loan I wanted, I returned to the office of "The Mutual, General, &c.," and gave in the names of the parties who had agreed to become my sureties. I was then told to call again the next day, when the medical officer of the company would meet me, and, after due examination, would report as to whether my health was such as to warrant my life being insured for three hundred pounds—treble the amount of the loan I had asked for.

At the hour appointed I was at the office—taking care to bring with me the one guinea, "*not one pound*," as the clerk said, when he told me—required as a medical fee before I could be examined by the doctor. It so happened that I had always considered myself, and I was considered by others, to be an exceedingly healthy man. I was yet but in the prime of life, and had really never known what serious sickness was since I could remember. I therefore thought that this medical examination would be more a matter of form than anything else. Not so the doctor. He seemed determined to earn his fee conscientiously. Had I been endeavouring to enlist in her Majesty's Life Guards he could not have taken more trouble to find out whether there was not something amiss with me. Not succeeding in discovering, in my present state of health, anything that he could object to, he made me go back into a complete history of my past sanitary life, putting to me leading questions much the same as a French procureur-général does to a prisoner, when he is doing his utmost to make him out as criminal as possible. At last he fairly ran me to ground by an acknowledgment on my part that ten years previously,

when in India, I had been confined to bed for a week with what I believed one of the doctors who then attended me had called rheumatism. This discovery appeared to make the medical adviser of the "MUTUAL GENERAL BENEVOLENT AND PRUDENT" quite happy. Of this rheumatic admission on my part, he never lost sight of throughout our interview. He talked about my spleen, asked questions about my liver, remarked that men with florid complexions had often a tendency to apoplexy, and that people who had resided long in India often died suddenly when they came back to England. But he never entirely abandoned the rheumatism, every now and again returning to the subject, and making little pencil notes all the time on the margin of the printed form he had before him.

Happy at last to be done with this medical tormentor, I rushed from the office, and went to see whether my sureties had been written to respecting the proposed loan. I found one of them, my Indian friend, looking over the printed paper which he had received from the "MUTUAL GENERAL" office. These papers contained a series of questions which each surety had to answer, and which, taken together, formed a complete private history of the individual who replied to them. "I would almost lend you the money myself," said my friend, "rather than answer all these impertinent queries." However, as he had promised to "see me through it," he kept his word, and in due time the papers of my three friends were returned properly signed and attested to the Loan and Insurance Office.

Five days later I received a formal answer to my application. It was to the effect that the insurance upon my life could be effected, but that, owing to previous sickness—the rheumatism, I presume, had been made the most of—I must be charged a higher rate of premium than what was marked in the tariff of the "MUTUAL AND GENERAL" for men of my age. Further, that the loan I proposed would be carried out, provided I obtained another surety in the place of Mr. Blank—one of the gentlemen whose name I had given in as agreeing to sign the bond with me—who could not be accepted by the office, because he was already surety for another loan in another insurance office.

Here, then, was all my labour and anxiety thrown away. I had tried hard to get three friends to be joint sureties for me, and had, after a vast deal of trouble, succeeded. I had paid two guineas inquiry fees, and one guinea medical fee, at the "MUTUAL GENERAL" (besides ten pounds to stave off further proceedings in the matter of the bill on which I was sued). Of this week but one day was left me, and I was as far as ever from obtaining what I wanted. In utter despair I went—as a last and desperate resource—to a loan office of the commonest description. I paid half a sovereign that was asked of me as an inquiry fee, and which was received by the seedy clerk, to whom I paid the money, with a grin of satisfaction, as if at the prospect of his next Saturday night's wages being higher than usual. I never expected to obtain a loan from this office, and therefore can hardly say that I was disappointed when informed that the directors were "not prepared to entertain my proposition." If they had said that the office had no money to lend, it would have been nearer the truth, for I verily believe that this establishment lived entirely upon the inquiry fees, and that directors, trustees, shareholders, manager, secretary, actuary, accountant, auditor, and cashier, were one and all represented by the seedy clerk who had been so pleased to receive my ten shillings inquiry fee.

Men in trouble often do last what they ought to have done first, and this was my case. To borrow the money with which to pay off the debt I found utterly impossible, except upon terms which would be but adding greatly to my embarrassments at a not very remote period. In backing my friend's bill I had acted foolishly, imprudently, and even wickedly; for no one has any right to promise what he cannot fulfil. There was but one remedy left me if I wished to save being locked up in Whitecross-street prison, and that was to take out my protection as a bankrupt. I did so, and went through the court, greatly regretting the money and time I had wasted in endeavouring to procure a loan, and firmly resolving never again, on any consideration whatever, to write my name upon stamped paper.

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